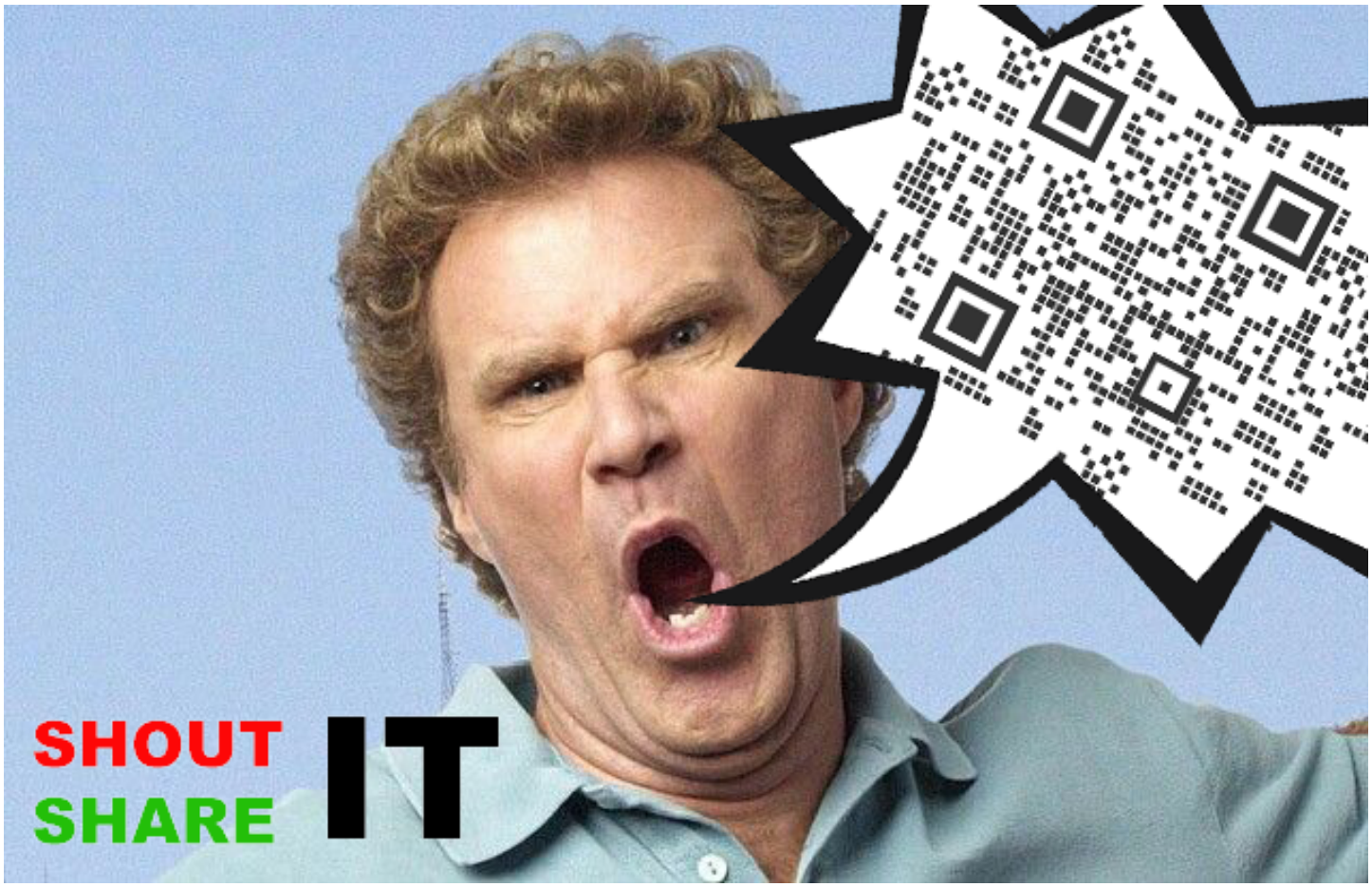
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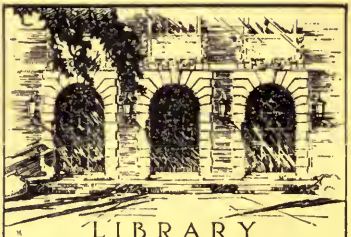

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FLORA OF PERU

BY

J. FRANCIS MACBRIDE

CURATOR, PERUVIAN BOTANY

BOTANICAL SERIES
FIELD MUSEUM OF NATURAL HISTORY
VOLUME XIII, PART III, NUMBER 3
NOVEMBER 17, 1950

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FLORA OF PERU

J. Francis Macbride

MALPIGHIACEAE Juss.

Reference: Niedenzu, Pflanzenreich IV. 141. Hefte 91–94. 1928.

Lianas or sometimes erect shrubs, rarely arborescent, always more or less suffruticose, the usually opposite mostly petioled and entire pinnately nerved leaves abundantly glanduliferous, the trichomes most often brachiate, bifurcate. Stipules usually present, most often small, variously placed. Inflorescence terminal or axillary, simple or compound, rarely reduced to a single flower, the articulate peduncles mostly bracted and bibracteolate. Flowers hermaphrodite, rarely apetalous, the 5 sepals rarely connate at base, nearly always with 1 (2) glands, the 5 petals commonly clawed and diverse, often crenulate to ciliate. Stamens 10 and all fertile or ordinarily in part staminodia, the filaments usually more or less connate, the 3 styles usually free, obtuse, capitellate or dilated at tip, sometimes acute, the gynaecium usually 3-carpellate. Ovules solitary, pendulous. Fruit 3(2–4)-parted, capsular, drupiform or nuciform, often more or less, and irregularly, winged or samaroid, and simulating some Sapindaceae. Seeds without endosperm.

The family is known particularly for the highly narcotic alkaloid furnished especially by *Banisteria caapi*, which see below; omitted is the related Amazonian (Pará) genus *Cabi* Ducke, Arquivos Serv. Florestal 2, No. 1: 13. *pl. 1.* 1943, perhaps also narcotic but unique because the flowers are yellow, fruits not winged.

My indebtedness to the kindness of Dr. José Cuatrecasas in listing most of the negative numbers is noted with thanks. In most instances I did not see the prints.

Fruit more or less winged, usually 3 samaras affixed to an elevated torus; plants infrequently suberect, rarely entirely upright.

Samaras laterally (and variously) alate, dorsally merely carinate or shortly alate unless in *Diplopteris*.

Sepals (as bracts) spathulate to oblong or oblanceolate, the aestivation valvate; styles curved.....4. *Diplopteris*.

Sepal aestivation quincuncial; styles nearly straight unless in *Hiraea*.

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Lateral wings 1 (continuous) or parted top and base, thus 2.

Stipules basal; peduncle medially articulate and bibracteolate.....1. *Mascagnia.*

Stipules petiolar, sometimes apical; bractlets basal, the peduncle not articulate.....2. *Hiraea.*

Lateral wings biparted or deeply bilobate.....3. *Tetrapteris.*

Samaras dorsally alate, laterally inconspicuously if at all.

Stamens all fertile; style tips obtuse or uncinate.

Stigmas lateral; upper (ventral) margin of samara wing thin (wing rarely equally thick).....5. *Heteropteris.*

Stigmas orbicular-capitellate on clavate or truncate styles; samara wing thinner at lower (dorsal) margin.
6. *Banisteria.*

Stamens usually in part sterile; styles more or less dilated with lateral stigmas.....7. *Stigmaphyllon.*

Fruit drupaceous, nut-like or capsular, the torus flat or concave; plants erect except *Dicella* and sometimes *Spachea.*

Flowers 2 or more on each little branch of the nodding racemiform inflorescence; bracts glandular, at least the sterile.

Bracts glandular; styles short; cocci smooth; stipules united, caducous.....8. *Spachea.*

Bracts eglandular except the sterile; styles exserted; cocci carinate; stipules subulate, nearly free.....10. *Lophanthera.*

Flowers solitary in racemes or corymbs; bracts eglandular except *Bunchosia.*

Flowers in terminal more or less elongate racemes; bractlets eglandular; styles subulate apically.

Petals of the showy flower persisting; leaves small, thin.
9. *Galphimia.*

Petals of the medium or small flowers deciduous; leaves mostly firm.

Petals subequal, usually eglandular; styles straight; torus hirsute; stipules usually minute or small.
14. *Byrsonima.*

Petals dissimilar, the fifth glandular; styles early uncinate; torus glabrous; stipules conspicuous, persistent.
15. *Burdachia.*

Flowers in corymbs or axillary racemes or panicles, these often short; styles obtuse (dilated apically, *Dicella*).

Petals glabrous; sepals not accrescent.

Bractlets eglandular; flowers not yellow; pyrenes rough. 11. *Malpighia.*

Bractlets glandular; flowers yellow; pyrenes smooth. 12. *Bunchosia.*

Petals sericeous; sepals accrescent after flowering. 13. *Dicella.*

1. MASCAGNIA Bert.

Mostly scandent shrubs, the leaves reticulate-nerved with small stipules affixed laterally to the petiole bases, the flowers in the Peruvian species, except those of *M. psilophylla*, racemose or panicled, the fruits variously samaroid. Calyx usually 8-glandular, the ovate-lanceolate or oval sepals puberulent without, glabrous within. Petal blade above the claw cordate or obovate, sometimes sericeous without. Stamens usually glabrous, the styles apically rounded to uncinate, rarely somewhat sigmoid. Samara wings often distinct, often continuous but the dorsal and intermediate ones, if developed, small.—Genus named by Bertero for Paolo Mascagni, the famous professor of anatomy who died in Florence in 1815.

Petals sericeous without; anthers glabrous or pulverulent, the stamens subequal; samara wing continuous in *M. macrodisca* and *M. anisopetala*, in others more or less incised, the dorsal crest oval.

Flowers in small panicled umbels, the pedicels clavate; samara wings 3, free above and below; leaves glabrate, usually drying dark.....*M. psilophylla.*

Flowers in racemes or corymbs, the pedicels not or obscurely clavate unless in *M. amazonica* or *M. rigida;* samara wings 1 or 2 unless in former; leaves usually drying green or brown, or pubescent.

Leaves soon glabrate unless the nerves; petals yellow; anthers typically puberulent; pedicels somewhat clavate; lateral wings 2, separate (*M. rigida*)....*M. amazonica, M. rigida.*

Leaves pilose or sericeous beneath; anthers glabrous (except *M. pubiflora*); lateral wings continuous, the 1–many dorsal crests about oval.

Leaves petioled; petals not yellow; pedicels not clavate.

Sericeous shrub or liana; samara wing 6–8 cm. wide. *M. macrodisca.*

Pilose-tomentose liana; samara wing 2.5–5 cm. wide. *M. nobilis, M. anisopetala.*

Leaves subsessile; petals yellow-orange; pedicels slightly clavate..... *M. pubiflora.*

Petals glabrous; anthers glabrous or pilose, the stamens sometimes unequal; samara wing continuous or merely incised once or twice except in *M. sericans.*

Anthers pilose; stamens as styles, these uncinate, unequal; petals not yellow; samara wing orbicular, apically incised; leaves glabrate..... *M. ovatifolia.*

Anthers glabrous; stamens as styles (rarely uncinate) subequal or the former unequal in *M. cordifolia.*

Leaves soon glabrate or glabrous; styles in part except *M. sepium* uncinate.

Leaves oblong-elliptic or ovate-lanceolate; samara wing deeply incised.

Leaves oblong-elliptic; pedicels and styles elongate, the latter exserted..... *M. filipes.*

Leaves ovate; pedicels about 1 cm. long; styles short.

Flowers yellow..... *M. loretensis.*

Flowers roseate..... *M. tenuifolia.*

Leaves cordate-ovate or broadly elliptic; samara wing emarginate..... *M. sepium.*

Leaves pubescent, at least beneath, even the mature; styles obtuse or acute; dorsal crests oblongish, 1–few.

Petals yellow (or purple in age); anthers oval; styles subequal, obtuse or rounded at least in part; leaf pubescence sparse or appressed sericeous.

Leaves (in Peru) sparsely pubescent; samara with 1 continuous wing..... *M. sepium.*

Leaves lustrous sericeous beneath; samara wings 2, distinct. *M. sericans.*

Petals not typically yellow; anthers oblongish; styles at least in part truncate; leaf pubescence soft, usually dense.

Bracts 2–4 mm. long, the pedicels usually with 1 gland; stems often velvety pubescent..... *M. cordifolia.*

Bracts small, the pedicels eglandular; stems soon glabrate. *M. americana.*

Mascagnia amazonica Ndz. Arb. Bot. Inst. Lyc. Brunsb. 8: 59. 1926; 114.

Younger parts sericeous tomentulose, the branches glabrate, about 3 mm. thick; stipules at base of the short petioles minute; leaves lanceolate, acute at base, acutely acuminate, the acumen to 1.5 cm. long, little revolute, soon glabrate or somewhat pubescent beneath, eglandular, the 5–7 nerves prominent, the reticulate veins scarcely so, to 15 cm. long, 6 cm. wide; leafy panicles of about 5 racemes to about 3 dm. long, the very acuminate biglandular bracts and bractlets 3–5 mm. long, the clavate pedicels 5–7 mm. long; sepals acute, revolute at tip; flowers 2 cm. broad, the spreading yellow petals sericeous beneath, 8–9 mm. long, the claw 1.5 mm. long; styles subequal, nearly straight, obliquely obtuse; samara not known. —Much like *M. rigida* but the leaves lanceolate. F.M. Neg. 12685.

Río Acre: Seringal San Francisco, *Ule 9478*, type. Brazil.

Mascagnia americana Bert. in Colla Hort. Ripul. 85. 1824; 99.

Liana, the terete branches and branchlets slender, at most 2 mm. in diameter, the latter as the 5 cm. long racemes densely velutinous with rufous rigid trichomes about 0.5 mm. long; leaves ovate or obovate, more or less cordate, acutely acuminate, to 1 dm. long, half as wide, revolute-margined, membranous, densely orange or yellowish rigid-pubescent beneath, the 4–6 prominent nerves rufous sericeous and with 1 or 2 obscure glands at base, glabrate and eglandular above; petioles about 1 cm. long, rufous sericeous and with 2–4 small glands; stipules lanceolate or subulate, 10–13 mm. long; racemes to 16-flowered, the peduncle in fruit to 2 cm. long, disposed in pyramidal panicles to 13 cm. long; bracts and bractlets little shorter than flowering peduncles (minute in Peruvian specimen), 1–2.5 mm. long; flowers unknown in type; samara puberulent, the wing 3–5 mm. wide, excised at apex, to 2.5 cm. long, oblong dorsal crest to 1.5 cm. long.—The Weberbauer plant referred here by Niedenzu had lilac flowers; petals equal, glabrous, minutely crenulate, 5 mm. long; styles rounded or truncate; anthers glabrous. F.M. Neg. 8021.

Piura: At Quiros between LaRosa and Olleros, 1,400 meters, *Weberbauer 6353* (may be doubtful). Colombia; Venezuela.

Mascagnia anisopetala (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 95. 1858; 106. *Hiraea anisopetala* Juss. in St. Hil. Fl. Bras. 3: 15. 1832.

Ashy pilose-sericeous liana, usually only the leaves glabrate in age above; stipules subulate, barely 1 mm. long; petioles stout, 7–20 mm. long, evanescently glandular; leaves ovate-elliptic (often broadly elliptic in Peru) or oblong, acute or obtuse at base, acuminate or obtuse and apiculate, to 13(15) cm. long, 6.5(10) cm. wide, membranous-chartaceous, smooth and lustrous above, rarely more or less glabrate beneath, the 5–6(8) primary nerves prominent and with the secondary reticulate, the basal marginal glands 2–5; racemes usually many in panicles; floriferous pedicels none to 2 mm. long, bibracteolate 4–7 mm. below the apex, pedicels 3–6 mm. long, bracts and bractlets ovate or lanceolate, often recurved, 3–5 mm. long and with none or as many as 4 glands; flowers 10–12.5 mm. wide, lilac or rose, sepals lanceolate with 8 glands free and recurved at tip; petals extremely unequal, the fifth at least twice as long as the rest, all minutely and closely denticulate, sericeous; styles equal, compressed, acute; samara wings suborbicular, 3.5–5 cm. wide, cleft to subglobose nut and overlapping at top, the many (type) dorsal crests 1–1.5 cm. high, 6 mm. wide; ventral areole broad as long (4 mm.). The material placed here has 1–few crests.—Illustrated, Pflanzenreich, l.c. page 93 (fruit and flower). F.M. Neg. 24285.

San Martín: Tarapoto, *Williams 5504; 5619.*—Loreto: Mishuyacu, *Klug 522.* Yurimaguas, *Killip & Smith 27557.* Aguaítia, (*Woytkowski 34453*, det. Cuatrecasas). To Paraguay and Brazil.

Mascagnia cordifolia (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 95. 1858; 97. *Hiraea cordifolia* Juss. in St. Hil. Fl. Bras. 3: 19. 1832.

Apparently very much like *M. sepium* but the pubescence typically velutinous (however the leaves are sometimes, it seems, glabrate in Peru), the bractlets provided with a large gland, the petals roseate or lilac (sulphureous, subsp. *thiantha*), and the stamens rather unequal with often oblongish anthers.—The var. *fusca* Sussenguth, Repert. Sp. Nov. 42: 46. 1937 differs from the type, according to its author, in the brown-velvety stems and petioles, the leaves to 12 cm. long, 11 cm. wide with much looser pilosity and with 2–4 glands beneath about 1 cm. remote from the margin; much more aberrant, and perhaps not correctly placed here, is *Klug 25* with strigose pubescence, sparse on the leaves but with the inflorescence (including glands, flower color and anthers) of *M. cordifolia* rather than of *M. sepium*, to which I at one time referred it, with query; it may be designated *M. cordifolia* var. **peruviana** Macbr., var. nov.,

foliis ovato-ellipticis ad 2 dm. longis, 1 dm. latis supra demum glabris subtus sparse strigosis. F.M. Neg. 12687 (subsp. *thiantha*).

Loreto: Liana in clearing with bright lilac flowers, Mishuyacu, *Klug 25* (type, var. *peruviana*).—Río Acre: Río Macauhán, *Krukoff 5781* (type, var. *fusca*). Middle Brazil; Colombia.

Mascagnia filipes Macbr., sp. nov.

M. loretensis differt stipulis vix 1 mm. longis, petiolis ad 12 mm. longis fere 2 mm. crassis, foliis oblongo-ellipticis apice breviter obtuseque acuminatis 13 cm. longis, 5–6.5 cm. latis, basi biglandulosis; pedunculis paniculorum 4–5 cm. longis, minute puberulis, floriferis vix 2 mm. longis, haud incrassatis; pedicellis circa 15 mm. longis; petalis suboblongis 4 mm. longis tenue carinatis; staminibus inequalibus ad 2 mm. longis.—It is for convenience that I compare this liana here (perhaps new only to Peru), as its relationship is probably elsewhere; the long-peduncled leafless axillary and terminal panicles, the latter about 1.5 dm. long and broad, are further distinctions, but without fruit its generic position—for that matter, of course, its family position—can only be surmised. The collector noted the flowers as pale lilac and yellow.

Loreto: Mishuyacu near Iquitos, *Klug 815* (type, U. S. Nat. Mus.).

Mascagnia loretensis Morton, Proc. Biol. Soc. Wash. 45: 49. 1932.

Branchlets slender, 2 mm. thick, elenticellate, glabrous; stipules persistent, cartilaginous margined, 2 mm. long; petioles slightly canaliculate, eglandular, to 9 mm. long; leaves ovate, rounded at base, gradually acuminate, to 9 cm. long, half as wide, concolor, lustrous above, plane, equally membranous to margin, the 5–6 nerves and reticulation equally prominent both sides; racemes to 12-flowered in terminal sessile leafy panicles about 6 cm. long, these leaves lanceolate, sparsely pubescent both sides; raceme peduncles 1 cm. long or so, densely strigose, floriferous peduncles to 2 mm. long, strongly clavate, medially bracteolate, the small ovate bracts and bractlets pubescent; flowers about 12 mm. wide, sepals oval, rounded, 3 mm. long, 8-glandular; petals yellow, glabrous, 4 mm. long, wing-carinate; anthers glabrous; anterior style truncate, 2 posterior uncinate; ovary hirsute; samara glabrous, obovate, nut ovoid, the areole linear-lanceolate, 5 mm. long, 1 mm. wide; lateral wings continuous at base, distinct at apex where both

are incised into lanceolate or ovate lobes, 15 mm. broad and high, margins irregular, the dorsal semiovate, 13 mm. long, 5 mm. wide, connate at base with lateral, the acute tip much longer than nut, intermediate wings none.—Allied by author to *M. violacea* and *M. nervosa*, the former with violet or roseate flowers, the petals scarcely carinate, lateral wings distinct base and apex, these in the latter continuous, both species with revolute margined leaves, larger in *M. nervosa*, and both species with narrower stipules and bracts.

Loreto: Mishuyacu near Iquitos, *Klug 907*, type. Puente Arturo, *Williams 5231* (distr. as *M. tenuifolia*).

Mascagnia macrodisca (Tr. & Pl.) Ndz. Arb. Bot. Inst. Lyc. Brunsb. 3: 16. 1908; 105. *Hiraea macrodisca* Tr. & Pl. Ann. Sci. Nat. sér. 4. 18: 326. 1862. *M. anisopetala* (Juss.) Griseb. var. *macrodisca* (Tr. & Pl.) Kosterm. Med. Bot. Mus. Rijks Univ. Utrecht 25: 5. 1936.

Like *M. anisopetala* but appressed sericeous, the trichomes subsessile, leaves to 17.5 cm. long, 9 cm. wide, lower petioles 2–3 cm. long, glabrous; sepal tips little longer than the glands; samara wing 6–8 cm. wide.—According to the collector the Peruvian plant was a liana; apparently it is referable here but the related species seems to be similar. The Williams specimen, unfortunately, like the type, has undeveloped flowers; therefore Kostermans' treatment of this plant as a variant marked merely by the leaves slightly sericeous beneath, while probably correct, remains to be proved. F.M. Neg. 24290.

Loreto: La Victoria, *Williams 2741*. Colombia; Surinam.

Mascagnia nobilis Morton, Proc. Biol. Soc. Wash. 45: 51. 1932.

Striate branches 4.5 mm. thick, the densely yellowish sericeous internodes about 1.5 dm. long; stipules thick, persistent, scarcely 0.5 mm. long; petioles about 2–2.5 cm. long, canaliculate, densely sericeous; leaves broadly ovate, rounded at base, rarely 4 mm. long-apiculate, usually 8–9 cm. wide, 10–15 cm. long, membranous, glabrous above except midnerve, densely pubescent beneath with slender stiped medially bifurcate trichomes and with a few glands, the eglandular margin scarcely revolute, the 5–6 nerves prominent beneath; panicles axillary, 2 dm. long in fruit, peduncles 7 cm. long, pubescent at internodes, the leaves similar to the lower but often

3 cm. long, 2 cm. wide; racemes about 10-flowered, lower peduncle 21 mm. long, upper shorter, floriferous, 2.5–4 mm. long, basally bracted with 2 bractlets about 2 mm. below the tip, 2 mm. long, eglandular, pedicels 4.5 mm. long; sepals glandular, recurved; samara densely sericeous, ventral areole ovate, about 4 mm. long, nut subglobose, 6 mm. long, lateral wings oval, membranous, 2.5 cm. wide, 4–4.5 cm. long, subentire, dorsal suborbicular, 4 mm. wide, much exceeding nutlet.—In Peru most like *M. sericans*, said to be erect with short internodes, coriaceous leaves and no stipules (Morton).

Loreto: Yurimaguas, *Killip & Smith 27557*, type.

Mascagnia ovatifolia (HBK.) Griseb. Fl. Brit. W. Ind. 121. (1859) 1864; 101. *Hiraea ovatifolia* HBK. Nov. Gen. & Sp. 5: 170. 1822. *H. elegans* Juss. Ann. Sci. Nat. sér. 2. 13: 261. 1840. *M. elegans* (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 95. 1858, fide Ndz.

Liana, the slender branchlets and laxly many-flowered racemes ashy puberulent, the glabrate striate branches to 5 mm. thick; petioles canaliculate above, slender, to 2 cm. long, glabrate to sericeous, eglandular or the glands minute, stipules triangular to subulate, less than 1 mm. long; leaves typically lanceolate-ovate, obtuse or rounded at base, more or less acuminate, to 12.5 cm. long, 5–7.5 cm. wide, plane, membranous-chartaceous, in Peru eglandular except for 2 glands on base beneath, early sericeous both sides, the adult glabrate, the 4–5 nerves slender; floral leaves to 1.5 cm. long; racemes disposed in ample panicles, the floriferous peduncles about medially bibracteolate, 2–4 mm. long, the bractlets minute, eglandular; flowers about 12 mm. wide, the oblong or oval sepals glandular, the limb of broad glabrous petals subdenticulate, 3–4 mm. long, the straight claw 3 mm. long; styles acute or uncinate, the 2 posterior sigmoid; stamens long-exserted, the oval anthers pilose at base; samaras sparsely long-pubescent, the mostly entire orbicular wings sometimes excised 3 mm., often 2.5–3 cm. wide, glabrous, membranous, strongly veined, the semicordate dorsal crest keel-like, 4–6 mm. long, 2–4 mm. wide.—The leaves are sometimes cordate, forma *cordata* Ndz. Type was from Cumana. The R. & P. specimen is *B. flabelliformis* of their journal. Illustrated, Pflanzenreich, l.c. page 93. F.M. Negs. 12694; 35630 (*M. elegans*).

Huánuco: Pozuzo, *Ruiz & Pavón.*—Junín: Vitoc, *Ruiz & Pavón.*—San Martín: Tarapoto, *Spruce 4954; Williams 6789.* Mount Chilcayo, *Ule 6707; 6708; Mathews 3124.*—Loreto: Yurimaguas,

Poeppig 2233; 1233, fide Juss., type, *H. elegans; "H. cyclocarpa* Poeppig" mss. On the Ucayali, *Tessman 3442; Killip & Smith 26883*. Near Iquitos, *Tessmann 4660*. Pongo de Manseriche, *Tessmann 6314* (det. Standley); *Williams 7898; 8218*. San Isidro, *Tessmann 4974*.—Cuzco: Valle de Santa Ana, (*Herrera*).—Río Acre: ?*Ule 9481*. Lower Río Nanay, *Williams 502*. Fortaleza, *Klug 2810*. Argentina and Paraguay to Ecuador and Trinidad. "Nojarilla" (Williams).

Mascagnia psilophylla (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 94. 1858; 120. *Hiraea psilophylla* Juss. in St. Hil. Fl. Bras. 3: 20. 1832. *Banisteria antifebrilis* Ruiz ex Griseb. Linnaea 22: 15. 1849. *M. psilophylla* (Juss.) Griseb. var. *antifebrilis* (Griseb.) Ndz. l.c. 121.

Scandent or subscandent shrub with alutaceous or cinereous branches about 5 mm. thick and yellow flowers mostly in 4-flowered, often corymbose or paniculate umbels; petioles nearly glabrous, sometimes biglandular below the tip, to 2 cm. long; stipules glanduliform or tuberculiform at each side of petiole base; leaves revolute, ovate or elliptic to subrotund, acute or obtuse at the often inequilateral base, often with acumen 2–3 cm. long, membranous-chartaceous, soon glabrate, 1–1.5 dm. long, 5–10 cm. wide, with 4–5 prominent nerves and 1–2 marginal glands on each side above the base; flowering peduncles 3–7 mm. long, the pedicels more than twice as long; bracts and bractlets minute, rounded; flowers 15 mm. broad, the sepals glandular, orbicular, the petal limb typically rounded, dentate, rarely glandular, sericeous without; anthers orbicular; styles recurved-divergent, sericeous; samara wings coriaceous, 3, the lateral sinuate, excised to the subglobose nut at base and apex, the whole 3–5 cm. wide, the middle dorsal wing oval, 5–7.5 mm. wide.—The Peruvian plant is said to be *M. psilophylla* var. *peruviana* Ndz. Arb. Bot. Inst. Lyc. Brunsb. 3: 28. 1908, the leaves to 3 cm. caudate-acuminate, umbels many in lateral panicles, petal limb spathulate, acute and glandular-fimbriate at base. Illustrated, Pflanzenreich, l.c. page 119. F.M. Neg. 12695.

Huánuco: Pueblo Nuevo, *Ruiz & Pavón*, type. North of Tingo Maria, *Stork & Horton 9543* (det. Standley). Chicoplaya, *Ruiz & Pavón*.—San Martín: Tarapoto, *Ule 6441*. Chazuta, *Klug 4052* (det. Morton).—Loreto: Fortaleza, *Williams 4219*. Pongo de Manseriche, *Tessmann 5454; Mexia 6330* (det. Standley, *Banisteria cinerascens*, var.; Morton, *B. peruviana*). Bolivia to Uruguay and Brazil. "Shillinto" (Klug), "lejuco de Calentuxas" (Ruiz & Pavón).

Mascagnia pubiflora (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 91. 1858; 115. *Hiraea pubiflora* Juss. in St. Hil. Fl. Bras. 3: 14. 1832.

All younger parts velutinous, the branchlets ancipital, the branches finally terete and glabrate; petioles subcylindrical, 3–5 mm. long, the subulate stipules only 0.5 mm. long; leaves cordate at base, ovate, acutely acuminate, 1–2 dm. long, 4–9 cm. wide, in age glabrate above except the nerves, these impressed or beneath prominent; racemes elongating to even 40 flowers, lax, the pedicels typically articulate medially, the ovate lanceolate very acute bracts and bractlets 5 and 3.5 mm. long or longer and pedicels little enlarged; flowers to 2.5 cm. wide; sepals broadly ovate, often revolute and glandular; petals densely sericeous, crenulate; stamens and styles subequal, the puberulent anthers oval, the styles especially the curved anterior acuminate; samaras velutinous, the broad wings to 2 cm. long.—Morton questions his determination but it seems to be correct. Illustrated, Niedenzu, l.c. page 109 (flower). F.M. Negs. 3561; 32415; 24292; 12696 (var.).

San Martín: Juanjuí, *Klug 4259* (det. Morton). Central Brazil.

Mascagnia rigida (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 92. 1858; 108. *Hiraea rigida* Juss. in St. Hil. Fl. Bras. 3: 14. 1832.

Younger parts (including the leaves beneath at least sometimes) appressed yellowish or greenish-orange, sericeous-strigose, the terete glabrate branches to 6 mm. thick; stipules deciduous, 1 mm. long; petioles canaliculate above, 1–1.5 cm. long; adult leaves elliptic or obovate, acute or narrowed at base, shortly acuminate, more or less sericeous beneath on the 4–5 nerves, otherwise sparsely pubescent or glabrate, densely reticulate, thin-chartaceous to rigid-coriaceous, to 13 cm. long, 3–7 cm. wide; racemes axillary to 4–5 mm. long, leafy bracted, disposed in close panicles, the rachises more or less persistently sericeous, the pedicels 3–6 mm. long, the bracts and bractlets glandular or eglandular; flowers about 13 mm. wide, yellow or orange, the acutish or rounded sepals glandular, the short-clawed cordate petals subentire to denticulate, early densely sericeous; anthers oval to obovoid, usually puberulent both ends; styles subequal, nearly straight, obtuse; lateral samara wings to 2.75 cm. long, 1.75 cm. wide, the dorsal crest 1–1.25 cm. long, 5 mm. wide, the nut rounded or little produced at base.—Illustrated, Pflanzenreich, l.c. page 109 (flower and fruit). F.M. Neg. 35633.

San Martín: Tarapoto, *Spruce 4227.* Juanjuí, *Klug 3881* (det. Morton).—Madre De Dios: Decumbent shrub, Iberia, *Seibert 2171.* Bolivia to Ecuador and Brazil.

Mascagnia sepium (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 96. 1858; 94. *Hiraea sepium* Juss. in St. Hil. Fl. Bras. 3: 19. 1832.

More or less persistently and sericeously pubescent liana with subsessile (typically) straight-branched or forked trichomes, the younger parts and axillary corymbs densely so, the branches glabrate, to 5 mm. thick, lenticellate; stipules minute (or apparently sometimes to 10 mm. long); petioles about 2 cm. long, sometimes much shorter or much longer; leaves ovate, often broadly, obtuse, rounded or cordate at base, more or less acuminate, usually about 10 cm. long, 8–9 cm. wide, the adult glabrate or puberulent, even densely so (the Peruvian form sparsely pilose), membranous to coriaceous, often with a number of impressed glands beneath, the margins revolute, the 4–6 primary nerves prominent; common peduncles 5–15 mm. long, floriferous bibracteolate below the apex or at least above the middle, 4–11 mm. long, pedicels velutinous, slender, 5–20 mm. long; bracts and bractlets mostly subulate-lanceolate, the latter often with 1 small basal gland and 1.5 mm. long, the former twice as long; flowers yellow, 10–13 mm. wide, sepals ovate, obtuse, 3–4 mm. long, petals incurved, nearly wing-carinate, glabrous; anthers ellipsoid, epipetalous stamens equal as the short nearly straight styles, the posterior more or less rounded dorsally; samara nut puberulent, wing ovate or orbicular, apex little produced, (2)2.5–3.5 cm. wide, dorsal crests to about 1 cm. long.—The material cited is not typical; but species is variable as interpreted. F.M. Neg. 32416.

Loreto: Mishuyacu near Iquitos, *Killip & Smith 29909; Klug 55.* Near Iquitos, *Williams 3711; 3569.* Argentina to Tobago and Honduras.

Mascagnia sericans Ndz. Arb. Bot. Inst. Lyc. Brunsb. 3: 21. 1908; 111.

Allied by the author to *M. rigida* but apparently not similar, the appressed sericeous pubescence mostly persisting and the anthers glabrous; petioles sometimes biglandular at base; leaves broadly obtuse to rounded or cordulate at base, usually much larger and with 7–8 nerves sometimes heavy-coriaceous; stipules none; pedicels 3–3.5 mm. long; bracts and bractlets acute, usually 1–2 glanduliferous;

sepals oblong, revolute at tip; petals glabrous, the oval or ovate limb 4, the claw 2 mm. long; samara sericeous or glabrate, the wings to 12 mm. wide, the semiorbicular dorsal crests 1.5–6 mm. wide.—The author referred the Tessmann collections to his var. *paraguariensis* with rather more rounded leaves, samara wings sinuate-margined, the crests to 6 mm. high. Morton has given an herbarium name (after the senior collector) to *Killip & Smith 27035;* there is indeed either considerable variation or more than one species concerned. F.M. Negs. 12697; 24293.

Loreto: Marshy wood near Iquitos, *Tessmann 3979; 5031; Killip & Smith 27035; Williams 3646.* Mishuyacu, *Klug 887.*—Río Acre: Seringal San Francisco, flowers yellow, then purple, *Ule 9482.* To Paraguay and Brazil.

Mascagnia tenuifolia Ndz. Arb. Bot. Inst. Lyc. Brunsb. 3: 10. 1908; 99.

Allied by author to *M. americana* and rather similar but the compressed canaliculate branchlets and inflorescence peduncles sparsely puberulent, the branches glabrate, mostly only 1.5 mm. thick; younger leaves sparsely sericeous, the adult soon glabrate both sides, acute or rarely cordate at base, mostly 8–10 cm. long, about half as wide, often shortly acuminate, with 6–8 nerves; petioles glabrate, 4–5 mm. long, the subulate stipules scarcely 1 mm. long; corymbiform racemules 8–12-flowered, disposed in leafy panicles; flowers rose-colored, hardly 1 cm. across, the orbicular subdenticulate limb 3 mm. long, claw 2 mm. long; samara wings orbicular 2–2.5 cm. wide or smaller, dorsal crests semiovate, acuminate, to 1 cm. high, about 3 mm. wide, the ventral barely 1 mm. wide.—The Peruvian variant is at least in part var. *amazonica* Ndz. l.c. page 100, leaves rounded at base, hardly 5 cm. wide, 12 cm. long, acumen to 2 cm. long, finally chartaceous; styles distinctly uncinate at tips; samara puberulent, the oval wings as much as 3 cm. high, 2–2.5 cm. wide. *M. hippocrateoides* (Tr. & Pl.) Ndz., 116, of Ecuador and north bears a superficial resemblance but has long-fimbriate fifth petal, elongate unequal styles, lateral samara wings divaricate. F.M. Negs. 12698; 21344 (vars.).

San Martín: Tarapoto, *Spruce 4607; 4958; Williams 6084; 6085; 6592; 6292* (leaves cordulate). Brazil; Venezuela.

2. HIRAEA Jacq.

Lianas in most respects resembling *Mascagnia* but the leaves areolate, not only the primary nerves but also the secondary parallel,

the stipules rather large, sometimes at base, sometimes at tip of petioles affixed; umbels always truly axillary or terminating short branches, now single, now disposed in panicles, more or less peduncled. Cotyledons very unequal, the inner one many times smaller than the thick plicate outer. Samaras variously cristate dorsally, the lateral wings membranous to coriaceous.—The involved treatment by Niedenzu of this group has been more bewildering to me, if possible, than his obviously labored efforts of cataloging elsewhere. Named for Jean Nicolas De La Hire, French physician of the early eighteenth century.

Stamens as styles subequal and straight; peduncle often conspicuously bracted below much shorter umbel..... *H. Spruceana.*

Stamens as styles somewhat unequal (former subequal, *H. fagifolia, H. crassipes*), the latter exserted and slightly curved; peduncle not elongate.

Leaves villous beneath all over, at least finely.

Trichomes mostly bifurcate, the umbel mostly 3-radiate. *H. ternifolia.*

Trichomes mostly simple as also the umbels..... *H. villosa.*

Leaves soon glabrate or glabrous beneath unless the principal nerves; species apparently not stabilized, i.e., characters either inconstant, noncomitant or intangible.

Stamens unequal; pubescence of oblong-lanceolate or obovate leaves soon restricted to midnerve or sparse; anthers little longer than broad.. *H. transiens, H. bahiensis, H. Kunthiana.*

Stamens subequal; leaves broadly elliptic, slightly if at all obovate; anthers oblong.

Styles sericeous at base; pubescence soon restricted to the midnerve or most obviously so..... *H. fagifolia.*

Styles glabrous; pubescence typically persisting, ashy sericeous, on all the nerves..... *H. crassipes.*

Hiraea bahiensis Moric. Pl. Amer. Rar. 107. 1830; 139.

High climbing liana, the branchlets and young leaves yellowish sericeous, the terete canaliculate branches glabrate and densely lenticellate, 4(–8) mm. thick, the adult leaves more or less glabrate and marginal glands obsolete; petioles 1–13 mm. long, the setaceous recurving stipules apical, about 2 mm. long; leaves nearly oblong, to 2 dm. long, 7 cm. wide, often narrower, usually acute at base,

mostly obtusely acuminate (acumen to 2 cm. long), chartaceous, nearly plane, the nerves on both sides prominent, the secondary more or less parallel, densely areolate; flowers to 2 cm. broad, pedicels 1–2 cm. long, bracts ovate, 2 mm. long, bractlets rotund, 1–1.5 mm. long; sepals broadly ovate, typically glandular; petal limb 6–8 mm. broad, cordate, deeply fimbriate, long-clawed, the fifth smaller; stamens unequal and as styles curved, especially the posterior at apex pediform-uncinate; samara wings auriculiform, often confluent at base 2–3.5 cm. high, 1.5–2 cm. wide, the portion above the globose nut (this more puberulent) higher and broader than the basal part, the dorsal crest more or less triangular, 4–6 mm. wide, 2–3 mm. high. —The Peruvian plant is sometimes forma *Salzmanniana* (Juss.) Ndz. l.c. page 140, the calyx without glands. It seems to me probable that the specimens cited could be included in *H. fagifolia* sens. lat. or *H. Kunthiana*. F.M. Negs. 24271; 24272 (forma).

San Martín: Flowers red and yellow, Zepelacio, *Klug 3375* (det. Standley, *H. transiens*). Flowers orange and white, Juanjuí, *Klug 3866* (det. Morton, *H. transiens?*).—Loreto: Puerto Meléndez, (*Tessmann 4866*). Flowers golden, Fortaleza, *Klug 2811* (det. Standley). Flowers yellow, Zungarosa, *Mexia 6300* (det. Standley, *H. transiens*). Flowers sulphur yellow, Florida, *Klug 1994* (det. Morton, *H. transiens*). To Argentina and French Guiana.

Hiraea crassipes Juss. Ann. Sci. Nat. sér. 2. 13: 258. 1840; 140.

Resembles *H. bahiensis* and *H. fagifolia;* branches minutely lenticellate, the leaves mostly oblanceolate and obtuse and persistently ashy sericeous on the nerves beneath; petioles 1–3 cm. long, the subapical linear lanceolate stipules 3–4 mm. long; leaves rarely obovate, rarely acuminate and apiculate, rounded or somewhat cordate at base, to 3 dm. long, 12 cm. wide, glabrate in age except the 12–15 nerves, eglandular; inflorescence often composed of 3 umbels, the fruiting pedicels clavate, to 3 mm. thick at apex, 13–20 mm. long, bracts mostly tricuspidate, the middle cusp 5 mm. long, the flowering bracts and bractlets ovate-rotund, 2–3 mm. long; flowers 15–17 mm. broad; sepals suborbicular, 8–10-glandular; stamens subequal, the styles mostly glabrous and scarcely uncinate at the little produced apex; samara wings obliquely oval, 3.5–4 cm. high, about 2.5 cm. wide, the back of the subglobose nut completely crested to 5 mm. high, scarcely 2 mm. wide.—F.M. Neg. 24270.

San Martín: Tarapoto, *Spruce 4600* (det. Niedenzu, *H. fagifolia*). —Junín: Vitoc, *Ruiz & Pavón*.—Huánuco: Cuchero, *Poeppig 1787*,

type.—Loreto: Pongo de Manseriche, scandent for 15 meters, *Mexia 6138* (det. Standley, *H. fagifolia*). Flood-free woods, mouth of the Santiago, (*Tessmann 4138*).—Peru-Colombia Boundary: Río Putumayo, forest, *Klug 1609* (det. Morton, *H. fagifolia*). Chile?

Hiraea fagifolia (DC.) Juss. Ann. Sci. Nat. sér. 2. 13: 258. 1840; 140. *Banisteria fagifolia* DC. Prodr. 1: 590. 1824. *H. Blanchetiana* Moric. Pl. Nouv. Amer. 104. *pl. 65.* 1841. *H. fagifolia* (DC.) Juss. var. *Candolleana* Ndz. Verz. Vorles. Lyc. Brunsb. W.-S. 14. 1906.

Very much like *H. crassipes* but the rather obtusely acuminate leaves mostly obovate, more or less cordate at base, and soon glabrate both sides except for the ashy sericeous midnerve beneath, even this glabrate in age, the primary nerves rubescent, the pedicels 0.5–1 mm. thick, the styles more or less sericeous at base, the dorsal crests of the samara affixed only to the upper part of the nut; petioles 5–10 mm. long, their subapical stipules setaceous; panicles ashy sericeous, composed of 1–5 umbels, the pedicels 12–15 mm. long, the ovate bracts and bractlets 1–2 mm. long; sepals eglandular or 8-glandular; anthers oblong; samara wings suborbicular to reniform forming a somewhat sinuate margined semicircle.—The var. *Blanchetiana* (Moric.) Ndz. has oval-oblong leaves, rounded at base, calyx glandular, dorsal crest scarcely 2 mm. high, characters of doubtful import. Illustrated, Moric. l.c. and Ndz. l.c. page 130 (fruit). F.M. Neg. 8016.

Junín: Chanchamayo, *Schunke 405; 328.* Florida, *Klug 2058.* Fortaleza, *Klug 2811* (det. *H. bahiensis* in herb.).—Loreto: Chapaga, *Ule 6709.* Flood-free rain forest, mouth of the Santiago, *Tessmann 4018; 4490; 4467.* Bolivia to Central America and Trinidad.

Hiraea Kunthiana Juss. Ann. Sci. Nat. sér. 2. 13: 258. 1840; 134. *Malpighia* (?)*obovata* HBK. Nov. Gen. & Sp. 5: 146. 1822. *H. obovata* (HBK.) Ndz. Verz. Vorles. Lyc. Brunsb. W.-S. 7. 1906, not Huber, Bol. Mus. Paraense 3: 424. 1902.

Liana, the younger parts sericeous-strigose but soon glabrate or in Peru apparently nearly glabrous, even the younger leaves and the shortly peduncled umbels, these often in three's, the flowers on slender pedicels 1.5–2 cm. long; petioles 2–4 mm. long with subulate stipules sometimes apparently small or obscure; leaves oblanceolate or obovate obtuse or rounded at the apiculate tip, more or less

cuneate at base, 8–12 cm. long, about a third as wide, chartaceous, finely but prominently nerved at least beneath; flowers 10–13 mm. wide; petals more or less denticulate; stamens as styles somewhat unequal; samaras puberulent with small biconvex nut and thin undulate margined veiny wings.—The Peruvian specimen only in flower has somewhat smaller nearly glabrous leaves. F.M. Neg. 37494.

Loreto: Mishuyacu near Iquitos, *Klug 737*. Bolivia to Mexico.

Hiraea Spruceana Ndz. Arb. Bot. Inst. Lyc. Brunsb. 4: 7. 1912; 129.

Liana, the younger parts including the compressed branchlets golden tomentose, this indument persisting in the typical form on the under surface of the leaves; petioles canaliculate above, to 2 cm. long, with 2 obscure glands and 2 stipules at base, the latter 3–5 mm. long and nearly concealed in tomentum; leaves elliptic or somewhat ovate, rounded at base, shortly apiculate, to 2 dm. long, more than half as wide, nearly plane, in age smooth and more or less evanescently puberulent above, the 12, more or fewer, primary nerves as the subparallel secondary prominent beneath, 2–5 mm. distant; peduncle (flowering branch) with 2 obovate rotund bracts 1–15 cm. long at the node, this about 5 cm. above the leaf-axil and 5–10 mm. below the umbel of around 20 flowers; pedicels at base 1, at apex 2 mm. thick, to nearly 3 cm. long, the minute thick ovate bracts and bractlets hidden in tomentum; sepals ovate, basally incurved, apically recurved, with 8 glands; petals cordate-ovate, about 5 mm. long and wide except the smaller glandular-dentate fifth; styles nearly straight, the obliquely obtuse tip dorsally acute.—Three related species have been proposed: *H. brachyptera* Tr. & Pl. 130, Colombian, *H. colombiana* Morton, Proc. Biol. Soc. Wash. 46: 88. 1933 and *H. pachypoda* Ndz. 131, of Ecuador; the first has oblanceolate leaves acute at base, long-acuminate, sericeous beneath, the second broadly elliptic cordate-based leaves, obtuse or apiculate, densely strigose beneath, the last subglabrous oblong-elliptic apiculate leaves. Under an unpublished name by Morton after the locality Putumayo and quite possibly occurring within Peru is a nearly glabrous cordate-based rotund-leaved plant, the peduncles without the leafy bracts that characterize the other species; in leaf-form it simulates the following Peruvian collection so closely that Standley gave it the ined. name. Because of the uncertainty of the relationship and the constancy of the characters concerned, I designate this liana with rust-yellow flowers only as *H. Spruceana* var. **Mortoniana**

Macbr., var. nov., ramulis ad apicem (demum rugoso-striatis et glabratis) petiolis pedunculisque dense strigose-pubescentibus ut videtur haud aureo-tomentosis; foliis basi rotundo-cordatulatis ad 3 dm. longis, 18 cm. latis, subtus sparse cum pilis furcatis puberulis; petiolis 2–4 cm. longis obscure vel haud canaliculatis ad basin versus bistipulatis, stipulis subulatis circa 2 mm. longis; pedicellis vix incrassatis, circa 15 mm. longis. F.M. Neg. 32414.

San Martín: Zepelacio near Moyobamba, forest, *Klug 3332*, type, var. Ecuador.

Hiraea ternifolia (HBK.) Juss. Ann. Sci. Nat. sér. 2. 13: 257. 1840; 136. *Malpighia* (?)*ternifolia* HBK. Nov. Gen. & Sp. 5: 146. 1822.

Liana with canaliculate typically puberulent-velutinous branchlets and leaves beneath; petioles to 2 cm. long, biglandular below the tip, the orbicular sessile glands often obscure, and setaceous stipules in type 2–5 mm. long, medial; leaves broadly obovate, rounded at tip, subcordulate at base, smooth and lustrous above, the fine nerves impressed but rather coarse beneath; flowers about 23 mm. wide in triradiate or paniculate umbels; sepals ovate, sometimes eglandular; petals subentire except the glandular ciliate fifth; anthers scarcely more than 1 mm. long; samara wings little broader than long, 18 and 15 mm.—The Peruvian specimen seems to approach *H. villosa* except for pubescence; it may be named *H. ternifolia* var. **peruviana** Macbr., var. nov., petiolis 5–8 mm. longis ad apicem bistipulatis, stipulis subulatis 2–3 mm. longis; floribus vix 1 cm. latis.

San Martín: Liana with golden-yellow flowers in forest, Juanjuí, *Klug 3801* (type, var. *peruviana*). Colombia; Venezuela; Brazil?

Hiraea transiens Ndz. Verz. Vorles. Lyc. Brunsb. W.-S. 8. 1906; 134.

Younger branches, branchlets and leaves sericeous, finally glabrate or the latter on the prominent nerves beneath ashy sericeous as the 7–18 mm. long petioles, these with 2–3 mm. long stipules below the apex; leaves obovate, obtuse or subcordate at base, obtuse or somewhat acuminate and apiculate at tip, usually 2.5 dm. long, 1.5 dm. wide, subplane, nearly smooth above, glanduliferous toward the tip; umbels 4–6-flowered, often many in a contracted corymb, bracts and bractlets about orbicular and 1 mm. long, the pedicels to about twice as long; flowers yellowish, nearly 15 mm. broad, the

sepals with 8 orbicular or oval glands, the cuneiform-orbicular petal limb 4–6 mm. long with claw about half as long, denticulate-fimbriate, the fifth one glandular; styles uncinate dorsally; immature samara with oval lateral wings, oblique-quadrangular dorsal crest.—Species of doubtful status, the salient characters possibly not significant: cf. *H. crassipes*, *H. fagifolia*. F.M. Neg. 12706.

San Martín: Juan Guerra near Tarapoto, (*Ule 6442*).—Loreto: Iquitos, (*Tessmann 4194*). To the Marañón, (*Tessmann 4590*). Colombia to Venezuela, Brazil and Bolivia.

Hiraea villosa [Poeppig] Ndz. Verz. Vorles. Lyc. Brunsb. W.-S. 11. 1906; 137.

Branchlets and umbels—these mostly simple on peduncles about 5 mm. long—and leaves beneath hirsute-tomentose with subsimple trichomes, some 1–2 mm. long; branches finally glabrate, slender, to 3 mm. thick; leaves obovate-lanceolate, acuminate (acumen to 1.5 cm. long), lucid with the 9–12 nerves impressed above, hispidulous or in age glabrate, more or less glandular dentate, hirsute beneath, to 12 cm. long, 5 cm. wide; stipules 3–4 mm. long at about the middle of the 5–8 mm. long petioles; umbels usually solitary, pedicels about 1 cm. long, bracts and bractlets roundish, 1 mm. long; flowers nearly 2 cm. broad, the ovate sepals glandular, the petal limb orbicular; samara wings 4 cm. high, 2–2.5 cm. wide, the dorsal crest semiorbicular, rarely acutely acuminate.—Poeppig's name was unpublished and under a related genus. Illustrated, Pflanzenreich, l.c. page 130 (fruit). F.M. Neg. 12708.

Huánuco: Woods near Cuchero, *Poeppig 1668*, type. Colombia.

3. TETRAPTERIS Cav.

Mostly scandent shrubs with entire petioled leaves, interpetiolar stipules attached to petiole or to branch, and yellow flowers usually in corymbs or umbels disposed in terminal panicles rarely racemose or the corymbs or umbels simple, axillary or terminal. Calyx usually glandular, the sepals ovate-lanceolate. Petals glabrous or sericeous, often crisp margined, entire or dentate, the fifth rarely fimbriate. Stamens 10, all fertile, often subequal, the filaments more or less connate, the subequal styles straight or curved. Lateral samara wings usually parted into 4 and forming an "X," rarely 2-parted, about equal or the lower pair (rarely the upper) smaller, the dorsal and intermediate crests developed variously.—Cavanilles

wrote the name *Tetrapteris;* except for convenience the group would probably be a section of *Triopteris;* cf. *T. crispa* subsp. *pseudotriopterys,* and only the fruit distinguishes it from *Mascagnia* and *Hiraea.*

Leaves obviously tomentose or sericeous beneath even when mature; umbels (sometimes irregular) in panicles bracted by gradually reduced leaves and bracts.

Stipules inconspicuous, 1–4 mm. long, or lacking; petioles or leaves or both, glandular.

Leaves more than half as wide as long; intermediate crests several, unequal; lateral wings 1.5–2 cm. long.
T. phlomoides var. *crotonifolia*

Leaves about one half as wide as long or narrower; intermediate crests none or one or sometimes several or lacerate; lateral wings 1–1.5(2) cm. long.....*T. Jamesonii* et vars.

Stipules at least on younger branchlets, conspicuous, 5–7 mm. long; petioles as leaves eglandular.....*T. stipulacea*

Leaves soon glabrous or glabrate beneath or inflorescence clearly not leafy.

Umbellulate flowers bracted by more or less modified leaves; upper samara wings usually more than 2 cm. long; fruit as other characters of next five species doubtfully constant.

Intermediate fruit crests present; flowers 12–17 mm. wide; styles nearly straight and equal; upper samara wings 2–3 cm. long.....*T. multiglandulosa,* var., *T. discolor*

Intermediate fruit crests lacking or reduced or dorsal one prominent and entire (characters doubtful but traditional; the "species" unproved).

Styles somewhat curving, unequally thick; panicles terminal; flowers scarcely 1 cm. wide; upper samara wing 3.5; lower 1 cm. long.....*T. magnifolia*

Styles various but flowers usually wider in axillary as well as terminal inflorescences.

Styles about equally thick; flowers 13–18 mm. wide; upper samara wings often 2 cm. long.....*T. acapulcensis*

Styles slightly unequal or the anterior more slender; flowers about 15 mm. wide; upper samara wings 2–3 cm. long.
T. peruviana

Racemulose or corymbulose flowers not leafy bracted; upper lateral samara wings often less than 1.5 cm. long.

Petals glabrous; lateral samara wings 3–4 mm. wide or in part styliform or lobed or lacerate except *T. mucronata.*

Bracts several mm. long, firm or fleshy, conspicuous; stipules petiolar but obscure; samara wings subequal, about 1 cm. long or if longer unequal and in part lacerate.
T. styloptera, T. complicata.

Bracts or at least bractlets inconspicuous or minute, thin; samara wings often longer than 1 cm. or connate at base and denticulate.

Leaves soon glabrous; stipules interpetiolar; styles slender, elongate, straight or nearly; anthers to 2 mm. long; flowers 10–15 mm. wide.....*T. mucronata.*

Leaves sericeous beneath; stipules petiolar or obscure; styles curved; anthers 1 mm. long; flowers 8–10 mm. wide.....*T. Poeppigiana.*

Petals more or less sericeous; lateral samara wings 5–10 mm. wide.

Leaves and bracts eglandular.

Petals cordate, subentire; styles pubescent; leaves usually acute at base; samara wings glabrate.*T. Guilleminiana.*

Petals obovate, crenate; styles glabrous (?); leaves rounded at base.....*T. Juliani.*

Leaves and bracts multiglandular; petals oval, crenulate; styles glabrous; samara wings sericeous.
T. multiglandulosa.

Tetrapteris acapulcensis HBK. Nov. Gen. & Sp. 5: 168. 1822; 213. *T. crispa* [Rich.] Juss. Ann. Sci. Nat. sér. 2. 13: 265. 1840. *T. crispa* [Rich.] Juss. var. *punicans* Macbr. Field Mus. Bot. 8: 121. 1930.

Resembles *T. magnifolia;* branchlets and inflorescence peduncles compressed, ashy sericeous, the reddish glabrate smooth branches to 4 mm. thick; stipules ovate, 1.5–2 mm. long; petioles 8–13 mm. long or longer; leaves ovate-elliptic or lanceolate-ovate, obtuse to somewhat cordate at base, more or less acuminate, to 1.5 dm. long, 1 dm. wide or larger, adult glabrate both sides or beneath on the 5–6 prominent nerves sericeous, minutely glandular on margins; flowering peduncles and pedicels 3–5 mm. long, bracts and bractlets

1.5 mm. long; flowers 13 to nearly 18 mm. wide, sepals ovate, limb of petals 5–7 mm. long; anthers 1.3 mm. long; upper samara wings typically obliquely obovate-oblong, to 3 cm. long, 1 cm. wide, the about oval lower ones 1 cm. long, 4–5 mm. wide, the dorsal scarcely 0.5 mm. (*Poeppig 1892*) or usually about 3 mm. wide.—The monographer distinguished several variants, notably *ovata* Ndz. and *subcordata* Ndz., chiefly sorted on shape of leaves; also *Kunthiana* Ndz. and *pseudotriopterys* Ndz., the former like *subcordata* but petioles 2–3 mm. long, leaves lustrous, to 6 cm. long, half as wide, the latter like *subcordata* but the lower wings reduced to a lobe scarcely 3 mm. long, 2 mm. wide, thus simulating the genus *Triopterys* and possibly better treated as *T. Triopteris* Macbr. l.c. Illustrated, Pflanzenreich, l.c. page 13 (fruit) and page 202 (styles). F.M. Negs. 35597 (*T. crispa*); 24279 (var.); 24277 (var.).

Huánuco: Near mission Tocache, *Poeppig 1892*. Pozuzo, *Ruiz & Pavón*. Muña, *3904* (type, var. *punicans*). Above Muña, 1,700 meters, *Weberbauer 6711*. Without locality, *Poeppig*(?) *3123*, Herb. DeCandolle, var. *pseudotriopterys*.—Loreto: Río Mazán, *José Schunke 186* (det. Morton). Yurimaguas, *Williams 4300*. The R. & P. collection is the "*B. papilioniea*" of their journal. Bolivia to southern Mexico.

Tetrapteris complicata Miq. Nat. Stirp. Surin. Sel. 82. 1850; 181. *T. squarrosa* Griseb. in Mart. Fl. Bras. 12, pt. 1: 87. *pl. 16*. 1858.

More or less shrubby liana soon glabrous or glabrescent except for some sericeous trichomes on the ovate-lanceolate leaves beneath and the often many-flowered racemes including the incurved thick-glandular sepals; petioles 4–6 mm. long, the stipules minute or wanting; leaves mostly rounded at base, usually obtusely acuminate, described as 1–1.5 dm. long, about 5 cm. wide, but in Peru 6–7 cm. long, 3–4 cm. wide, lustrous above, chartaceous or coriaceous, the 5–7 primary nerves little prominent; racemes sometimes a dm. long, pedicels 12 mm. long with fleshy bracts and bractlets, the former ovate-lanceolate, 2–3 mm. long, basal, the latter larger, elliptic, at or below the middle, one with a large gland; flowers about 12 mm. wide; petals glabrous, 4–6 mm. long, filaments sericeous, anthers linear-oblong or narrowly elliptic, about 1.5 mm. long, minutely puberulous at least in one Peruvian specimen; styles nearly straight, glabrous; samara subglabrous, the scarcely unequal wings barely if at all sinuate, rarely 12 mm. long, 3–4 mm. wide, the dorsal crest 1–3 mm. high, to 5 mm. long.—The name of Miquel has been referred

by both Pulle and Kostermans to the species of Grisebach without question; Niedenzu however has queried its identity. The Peruvian plant may not be typical; compare *T. styloptera*. Related forms that may be expected include *T. maranhamensis* Juss., 179, with narrower bracts, larger flowers, erect sepals, lacerated dorsal crest; the more distinctive *T. acutifolia* Cav., 189, of the Amazonian region has corymbiform racemes or panicles and strongly recurved sepals. Illustrated, Fl. Bras. l.c. F.M. Negs. 24283; 32411.

San Martín: Tarapoto, *Ule 6349; Williams 5430; 5627; 5638; 6294; 6731*. Colombia to the Guianas; Brazil.

Tetrapteris discolor (G. F. W. Meyer) DC. Prodr. 1: 587. 1824; 205. *Triopteris discolor* G. F. W. Meyer, Prim. Fl. Esseq. 182. 1818. *T. ovalifolia* Griseb. Linnaea 13: 237. 1839.

Soon glabrous, the more or less tuberculate lenticellate branches slender, or 3–4 mm. thick, the internodes 1–10 cm. long; petioles plane or canaliculate above, to 18 mm. long, the stipules 1–2 mm. long; leaves obtuse or rounded at base, often oblong or somewhat obovate acute or mostly rather long-acuminate, to 13 cm. long, 5 cm. wide, or wider, typically glabrous both sides unless puberulent on the 6–8 primary nerves beneath (apparently sometimes lanuginose), the impressed glands obscure; umbels solitary in the axils or as many as 9 disposed in short corymbiform panicles, rarely as long as 2.5 dm.; pedicels 3–6 mm. long; bractlets semiorbicular; flowers 12.5 mm. broad, the erect sepals somewhat recurved at tips, 3–4 mm. long, the spreading petals sagittate from base, oval, subentire or denticulate, 4–5 mm. long with claw 1.5–2 mm. long; anthers obovoid; styles rather short, typically stout, equal or unequal, little divergent or spreading; samara sericeous, especially the globose nut, this 5 mm. across, the samara wings typically obovate (in one var. oblong), 15–18 mm. and 6–10 mm. long, 8–10 mm. and 6–8 mm. wide or narrower, suborbicular dorsal wings 4 mm. long, obovate or linear, intermediate 2–8 mm. long.—Variable. Illustrated, Pflanzenreich, l.c. page 202, fruit. F.M. Negs. 12743 (*T. ovalifolia*); 32410 (var.).

Junín: La Merced or region, *Killip & Smith 25243* (det. *T. crispa*); also *23741*.—San Martín: Zepelacio, *Klug 3295* (det. Standley).—Loreto: Mishuyacu, *Klug 111; 371* (these aberrant). Above Rancho Indiana, canary yellow flowers, *Mexia 6410* (det. Standley). Near Yurimaguas, *Klug 2773* (det. Standley); *Williams 3811; Killip & Smith 29086; Williams 4212; Killip & Smith 28936* (det. *T. crispa*);

Poeppig 2469 (type, *T. ovalifolia*). Mouth of the Río Santiago (*Tessmann 4268*, det. Niedenzu, *T. ovalifolia*). Bolivia to Central America, Trinidad and the West Indies.

Tetrapteris Guilleminiana Juss. Ann. Sci. Nat. sér. 2. 13: 263. 1840; 187.

With the ample panicles of the related *T. Poeppigiana* and in general rather similar; stipules sometimes obvious above the petiole base, the petioles 6–9 mm. long, usually medially glanduliferous; leaves elliptic-ovate to obovate or even oblong, acute or rarely obtuse at base, to 1 dm. long, nearly half as wide, glabrate and somewhat lustrous both sides except more or less (or scarcely) persistently sericeous beneath on or near the basal nerves, the 6–8 primary prominent, the reticulation rather so, eglandular; floriferous peduncles mostly none; linear bracts 2–4 mm. long; pedicels 7–9 mm. long, the oval rotund spreading bracts to 2 mm. long; sepals densely sericeous, glandular; petals in type only slightly sericeous, cordate roundish, 3–4 mm. long; stamens and styles more or less pubescent at base; samara glabrate except the 4–5 mm. broad nut, the lateral wings obovate to 11 mm. long, 8 mm. wide, subentire or sinuate, the lower often much smaller, the intermediate crests more or less continuous, sometimes to 6 mm. long.—Illustrated, Pflanzenreich, l.c. page 171 (fruit). F.M. Neg. 35602.

Loreto: Yurimaguas, (*Tessmann 5515*).—Río Acre: Seringal San Francisco, *Ule 9474*. Brazil.

Tetrapteris Jamesonii Turcz. Bull. Soc. Nat. Mosc. 31: 394. 1858; 216.

Among Peruvian species with umbellulate flowers marked by the combination of persistent pubescence on the leaves beneath and rather small flowers, these only 13 mm. broad; glabrate branches densely lenticellate; stipules deciduous, annulate-lanceolate-glandulate, scarcely 1 mm. long; petioles 2–9 mm. long; leaves ovate or obovate, obtuse, acute or subcordate at base, obtuse or shortly and obtusely acuminate at apex, to 11 cm. long, 6.5 cm. wide, revolute, membranous-chartaceous, finally glabrate, lucid and smooth above, softly tomentose-sericeous beneath, the 4–6 primary nerves prominent, reticulate, and with many glands on the margins below; upper leaves gradually reduced, rounded and retuse; umbels panicled, the slender flowering peduncles 2–4 mm. long, pedicels 3–5 mm. long, ovate or lanceolate bracts and bractlets 1.5–2 mm. and 0.5–1 mm.

long; spreading obovate petal limb 5 mm. long, thick somewhat recurved claw 2 mm. long; anthers oblong-oval, connective oblong; styles unequal; nut globose, densely sericeous, wings puberulent, the 2 upper semiovate, to 17 mm. long, 7 mm. wide, the lower ovate, 7 mm. long, dorsal to 5 mm. wide.—The Williams plant with several intermediate crests and narrower lateral wings, the umbels irregular, designated in herb. by Morton, probably new, may be named var. **Mortonii** Macbr., var. nov., alae laterales oblongae, 2 superiores 13 mm. longae, 5 mm. latae, 2 inferiores 5 mm. longae, 3 mm. latae, dorsalis circa 5 mm. longae utrinque 3–4 intermediae 2–3 mm. longae. Illustrated, Pflanzenreich, l.c. page 202 (as *T. crotonifolia* Benth.). F.M. Neg. 24280 (var.).

San Martín: San Roque, *Williams 7387; 7680* (type, var. *Mortonii*).—Cuzco: San Miguel, Urubamba Valley, *Cook & Gilbert 1029* (det. Morton). Ecuador; Colombia.

Tetrapteris Juliani Macbr., sp. nov.

Liana; ramulis teretibus petiolis canaliculatis pedunculisque compressis dense adpresseque fulvo-sericeis; petiolis 10–12 mm. longis; foliis ellipticis basi late rotundatis apice abrupte breviterque acute acuminatis plerumque 1.5 dm. longis, 7 cm. latis, chartaceis, supra nitidis, glabris, conspicue reticulato-venosis, subtus sparse adpresseque strigosis, nervis venisque prominentibus; floribus congestis, pedicellis vix 4 mm. longis; bracteis oblongo-obovatis circa 5 mm. longis, 3 mm. latis; sepalis oblongis glandulas 8; petalis flavis extus dense sericeis subobovatis minute crenulatis circa 7 mm. longis, 4 mm. latis; styli glabri.—In aspect, largely because of the small rounded bracts, this liana reminds one of *T. complicata* but with sericeous petals and no fruits its position has not been discovered. If it is new it may fittingly record the contribution my friend Julian Steyermark has made toward the completion of this work by his intelligent selection of the Museum's Peruvian collections for me. Here, since the specimen is better, I designate the one at the National Museum as the type.

Loreto: Mishuyacu near Iquitos, *Klug 347* (type, U. S. Nat. Herb.); also *Klug 894*.

Tetrapteris magnifolia Ruiz ex. Griseb. Linnaea 22: 22. 1849; 213. *T. calophylla* Juss. Ann. Sci. Nat. sér. 2. 13: 264. 1840, at least as to Peru. *T. calophylla* Juss. var. *glabrior* Benth. ex. Ndz. Verz. Vorles. Lyc. Brunsb. W.-S. 47. 1909. *T. calophylla* Juss. var.

glabrifolia Griseb. in Mart. Fl. Bras. 12, pt. 1: 77. 1858. *T. glabrifolia* (Griseb.) Small, N. Amer. Fl. 25: 126. 1910.

Younger parts minutely and appressed pruinose-sericeous with ashy or golden indument, the sparsely lenticellate 4 mm. thick branchlets soon glabrate as the large leaves, at least above; petioles to 7 mm. long, sericeous, canaliculate above, the promptly caducous stipules connate semiorbicular and entirely membranous or with a dorsal subulate callus 1.5 mm. long; leaves roundish to ovate-oblong, obtuse or rounded at base, rather obtusely acuminate, to 3 dm. long, and 13 cm. wide or wider, marginally little revolute, chartaceous, lustrous above, the 6–9 primary nerves prominent above, the reticulation rather conspicuous both sides; lower floral leaves oval to 2.5 cm. long, the upper orbicular, to 1.5 cm. long; umbels 4-flowered, disposed in ample panicles 2–3 times composite, the upper umbel peduncles 3–5 mm. long, the floriferous peduncles 4–6 mm. long, the pedicels 3–4 mm. long, ovate bracts more than 1 mm. long, orbicular bractlets scarcely 1 mm. long; flowers hardly wider than 1 cm., the broad glabrous sepals glandular, the limb of the petals subentire, sagittate at base, obovate, 4–5 mm. long, claw to 2 mm. long; anthers only 1 mm. long; styles essentially but not quite straight, the two posterior ones twice as thick as the anterior; samara densely pruinose-sericeous, nut spheroid, 2–4 mm. thick, lateral wings fleshy rigid coriaceous, the upper two oval, 2(3.5) cm. long, over 13 mm. wide, the broader lower oblong-suborbicular to 1 cm. wide, the dorsal crest one.—*T. nitida* Juss., 212, to be expected from Colombia or Brazil, has spiculate-tuberculate branches, stipules distinct, styles equal. It is possibly a variant of *T. calophylla.* F.M. Neg. 12736.

Huánuco: Chicoplaya, *Ruiz & Pavón*, type.—Amazonas: Chachapoyas, *Mathew 3123.*—Loreto: Yarina Cocha, Middle Ucayali, (*Tessmann 5446*). Río Putumayo, Peru-Colombia Boundary, *Klug 1654* (det. Morton); *Poeppig 2820* (fide Griseb.). Mishuyacu, *Klug 841* (det. Morton).—Río Acre: Seringal Auristella, *Ule 9489* (det. Niedenzu, *T. ovalifolia*).—San Martín: Zepelacio, *Klug 3255?* (det. Standley, *T. nitida*). Amazonian Brazil.

Tetrapteris mucronata Cav. Diss. 9: 434. *pl. 262.* 1790; 198. *T. crebriflora* Juss. in St. Hil. Fl. Bras. 3: 9. 1832; 197.

Appressed orange-reddish sericeous pubescence of the young parts soon deciduous or becoming obscure, the terete branchlets smooth, green or olivaceous, the third year branches grayish, about

mm. thick; petioles canaliculate above, 7–15 mm. long, the interpetiolar triangular stipules minute; leaves oblong, oval or oblanceolate, acute at base, rather obtusely acuminate, to 15 cm. long, 5.5 cm. wide, revolute margined, chartaceous to coriaceous, soon glabrate and lustrous both sides, the 8–10 primary nerves prominent beneath, the subparallel secondary approximate, densely reticulate and with some glanduliform spots; umbels 4(–6)-flowered in axillary panicles typically one-third to one-half as long as subtending leaves, the peduncles obsolete to 4 mm. long, the bracts rather ovate, small, pedicels 6–15 mm. long, bractlets scarcely 1 mm. long; flowers 10–15 mm. broad, yellow, the ovate sepals glandular or eglandular, the limb of the glabrous petals typically elliptic-orbicular, subentire, 6–8 (fifth one 5) mm. long; stamens more or less unequal, the oblong anthers 2 mm. long; styles slender, equal to unequal, curved to straight; samara glabrate, nut subglobose 4 mm. across, the entire lateral wings about oblong, the two upper 18–26 mm. long, 7–10 mm. wide, the two lower to 12 mm. long, 5 mm. wide, dorsal crests nearly 1 cm. long, often 1-dentate, the intermediate wings none to 3, oval, 1–3 mm. long, often 1–2-aculeate.—The Ule plant is var. **crebriflora** (Juss.) Macbr., comb. nov. (*T. crebriflora* Juss. l.c. and var. *dubia* Griseb. Vid. Medd. Kjoeb. 142. 1875), the panicles at least as long as the subtending leaves, petals narrower, upper samara wings oval, 1 cm. wide. F.M. Negs. 37466; 35596 (var.).

Río Acre: Seringal Auristella, *Ule 9475*. San Martín: Juanjuí, *Klug 4241* (det. Morton). Brazil; Guiana.

Tetrapteris multiglandulosa Juss. Ann. Sci. Nat. sér. 2. 13: 264. 1840; 190.

Liana, the younger parts including the often ample inflorescence densely subsericeous tomentose with yellow-orange serpentine slender trichomes; branchlets subterete, the glabrate reddish branches smooth or lenticellate, to about 5 mm. thick; petioles stout, puberulent, 5–10 mm. long, with minute spiculiform stipules above the base and 2–4 large patelliform glands on the upper part; leaves oval or oblong to ovate or obovate, obtuse at base, more or less acutely acuminate or sometimes obtusish and apiculate, to 11 cm. long, 5 cm. wide, the revolute margins especially the lower portion typically with many large stiped glands, early sericeous tomentose both sides, in age glabrate, smooth, lustrous and plane above, more or less puberulent beneath, the 6–8 primary nerves prominent, the reticulation rather so; racemules 2–10-flowered, typically linear bracts 3–5 mm.

long, flowering peduncles to 2 mm. long, pedicels 5–10 mm. long, flowering bracts linear to ovate and acute, to 4 mm. long, the bractlets rotund, 1–1.5 mm. long; flowers about 12 mm. broad, sepals and petals sericeous, the former glandular, the latter crenulate with oval limb 4–5 mm. long; anthers and style glabrous; samara sericeous including the 3–3.5 mm. wide nut, the oblong to obovate lateral wings repand at tip, to 12.5 mm. long, 5–10 mm. wide, the dorsal 2–3 mm. wide, the intermediate more or less continuous and irregular to 2 mm. or even 6 mm. high.—The Peruvian form is var. *peruviana* Ndz., the leaves long- and acutely acuminate, the racemes with many glandular petiolate leaf-like bracts 7–20 mm. long. In all probability this variety will prove, when recollected and in flower, to be *T. discolor*. F.M. Negs. 24281; 12739.

Puno: Woods in the valley of the Sandía, Tambo Azalaya, 1,500 meters, (*Weberbauer 1125*, var.); 279. Bolivia; Brazil.

Tetrapteris peruviana Morton, sp. nov. in herb. *T. discolor* var. *andina* Ndz. l.c. 206; probably, at least as to Peru.

Liana *T. acapulcensis* similis sed foliis rotundato-ellipticis plerumque circa 10(15) cm. longis, 6–8 cm. latis, subabrupte apiculatis supra nitidis; stylus anticus posticis plus minusve gracilior paullo longior; alae superiores suboblongae 2–3 cm. longae, 5–7 mm. latae, inferiores 9–12 mm. longae, 3–5 mm. latae, dorsalis vix 1 mm. lata.—Rather intangible in character but perhaps as distinctive as its apparent relatives and seemingly intermediate to *T. discolor* and *T. acapulcensis*. F.M. Neg. 12727 (*T. discolor* var. *andina*, in part).

San Martín: Lamas, *Williams 6422*. Tarapoto, *Ule 6348* (*T. discolor* var. *andina*, in part). San Roque, *Williams 7023*. Pongo de Cainarachi, *Klug 2636* (det. Standley, *T. discolor*). Zepelacio, *Klug 3662*, type (det. Standley, *T. discolor*).—Loreto: Pumayacu, *Klug 3154* (det. Standley, *T. acapulcensis*). Caballo-Cocha, *Williams 2134* (det. Macbride, *T. Poeppigiana*).

Tetrapteris phlomoides (Spreng.) Ndz. Pflanzenreich IV. 141: 208. 1928. *Byrsonima phlomoides* (Spreng.) G. Don, Gen. Syst. 1: 636. 1831. *Malpighia phlomoides* Spreng. Syst. 2: 385. 1825. *T. rotundifolia* Juss. in St. Hil. Fl. Bras. 3: 6. 1832. *T. crotonifolia* Juss. Ann. Sci. Nat. sér. 2. 13: 264. 1840. *Banisteria cordata* Vell. Fl. Flum. Text 191 (earlier name? 1825).

With the general character of the related *T. discolor* but at once distinct by the velvety tomentum that persists at least beneath

on the adult leaves and the gradually reduced floral leaves; upper branches to 7 mm. thick; petioles stout, 1–3 cm. long, with 2–4 more or less stiped glands below the apex; stipules free, ovate-lanceolate, 1–4 mm. long; leaves rotund or broadly obovate, obtuse to subcordate at base, obtuse or minutely and obtusely acuminate to 1 dm. long, 8 cm. wide, margins strongly revolute and glandular, upper surface more or less scabrous or glabrate, coriaceous-chartaceous, subulate, both 7–9 primary and the many secondary nerves impressed above, prominent beneath; uppermost floral leaves with petioles only about 5 mm. long; peduncles at articulation bifoliolate or bibracteolate, all often terete, 2–3 mm. long, the pedicels twice as long, bracts and bractlets round or ovate, 1–2 mm. long; flowers 17–20 mm. broad, the oval-rotund sepals glandular, the rather orange petals with more or less orbicular lacerate-dentate (?)blades, 5–7 mm. long, cylindric claws fully half as long; anthers oval, 1.5–2 mm. long, somewhat pubescent; styles equal or nearly straight or little curved, simply truncate; samara velutinous, the semiglobose nut 4 mm. across, the lateral wings obovate or oblong, the upper 15–nearly 23 mm. long, 7–10 mm. wide, the lower 8–10 mm. long, about 3 mm. wide; broad dorsal wings 3 mm. high, the intermediate deeply lacerate.—The Peruvian plant is var. *crotonifolia* (Juss.) Ndz., the leaves about 7 cm. long, 6 cm. wide, peduncles often complanate, leaves glabrate and lustrous above, anthers at base pilose. Illustrated, Pflanzenreich, l.c. page 202 (but petals not lacerate!). F.M. Negs. 12745; 35598; 35611 (*T. rotundifolia*).

San Martín: Tarapoto, (*Mathews 1461*, type, var. Herb. Hook.). Brazil.

Tetrapteris Poeppigiana (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 87. 1858; 183. *Hiraea Poeppigiana* Juss. Ann. Sci. Nat. sér. 2. 13: 260. 1840.

Scandent, the compressed branchlets sericeous, the glabrate terete branches lenticellate, 3–4 mm. thick; petioles nearly terete, 7–13 mm. long with 2 large orbicular glands borne about medially; stipules inconspicuous; leaves ovate or lanceolate, rounded or subcordate at base, acutely acuminate (acumen to 3 cm. long), plane, typically eglandular, chartaceous, glabrate above, appressed metallic (in Peru silvery) pubescent beneath, to 23 cm. long, 8–11 cm. wide, the 8–11 primary nerves prominent beneath, the more or less parallel secondary densely areolate both sides; panicles very ample, 4 times composite, the racemules or corymbs 2–8-flowered, the peduncles

to 1 mm. long, the pedicels 3–4 mm. long, the lanceolate-ovate bracts and bractlets almost minute; flowers scarcely wider than 1 cm., the lanceolate-oblong sepals often glandular, the limb of the glabrous petals subrotund, 3–4 mm. long; stamens and styles little exserted, the anthers glabrous, the styles lightly sigmoid, obtuse and rather obliquely produced; samara densely sericeous, the nut globose, the wings obovate, lacerate or bi-or tri-lobed, the lobes often lacerate, 2 of the lateral often more or less continuous at base or often connate into one that is somewhat 4-lobed; dorsal crests semiorbicular, 1–2 mm. wide.—The Peruvian plant is variant *glandulifera*, l.c. page 184, the leaves to 13 x 8 cm., shortly acuminate or obtusish with many glands on the margins; flowers yellow-orange. Illustrated, Pflanzenreich, l.c. page 171 (raceme and fruit); Fl. Bras. l.c. (*pl. 17*). F.M. Neg. 19347.

Río Acre: Seringal Auristella, *Ule 9483*. Amazonian Brazil.

Tetrapteris stipulacea Macbr., sp. nov.

Ramulis, petiolis (ad 10 mm. longis, non glandulosis) pedunculisque inflorescentiorum densissime tomentosis; stipulis in rami conspicuis interpetiolaribus late ovatis obtusis circa 7 mm. longis fere 5 mm. latis, non connatis; foliis ellipticis vel late ovalis 10–17 cm. longis, 6–10 cm. latis basi apiceque rotundatis apice minute apiculatis membranaceis supra nitidulis medio nervo excepto glabris subtus plus minusve adpresse pilosis ut videtur non glandulosis et demum glabratis; foliis floriferis similibus sed subsessilibus bractiformis utrinque pilosis margine valde repando-crenulatis; floribus ignotis.—Notwithstanding the undeveloped state of the specimens, the species—if a *Tetrapteris*—is apparently well marked by the large stipules and thus may be given a name, as it would be recognizable by this single character.

Loreto: Fortaleza near Yurimaguas, *Klug 2789*, type.

Tetrapteris styloptera Juss. Ann. Sci. Nat. sér. 2. 13: 262. 1840; 178.

Glabrate branches lenticellate; petioles short, the minute stipules deciduous; leaves glabrous except for some marginal glands near base, ovate-lanceolate sometimes narrowed to an acumen, middle nerve prominent beneath, 7–10 cm. long, 2.5–3.5 cm. wide; racemes axillary, commonly geminate or ternate or forming sessile panicles at base of branchlets, shorter, subequaling or little longer than the leaves; common peduncles sericeous puberulent, the pedicels a little

longer than the floriferous peduncles, bracted at base, bibracteolate at apex; larger bractlets longer than the pedicels, 4-glandular at base; calyx segments narrowly ovate, hirsute and biglandular at base; petals 3 times longer than calyx, scarcely clawed, obovate, margin crisply denticulate; stamens scarcely exceeding the calyx, filaments pubescent, anthers glabrous; ovary hirsute apically; young samara glabrate, produced above in a crisped crest, lower wings transversely oblong-cuneate, lacerulate on margin, the shorter upper suberect, rigid terete and styliform.—Description after original, plant not seen by Niedenzu, who, however, allied it to *T. squarrosa*, i.e. *T. complicata*, as well as to his similar *T. boliviensis*, which may be transitional, fide the author himself by way of his var. *granatensis*. Illustrated, raceme and fruit, *T. boliviensis*, Ndz. l.c. page 171; also, samara, Jussieu, Arch. Mus. Paris 3: *pl. 18*, this, however, probably aberrant due to age or breakage and probably collections from the type locality will prove the species to be the same as *T. complicata* (*T. squarrosa*) and then the earlier name. F.M. Neg. 35613.

San Martín: Tarapoto, (*Mathews 1464*, type, Herb. Paris & Hook.).

4. **DIPLOPTERIS** Juss.

Scandent shrubs characterized particularly by the valvate sepals, these for known species spathulate, oblanceolate or oblong, tomentulose at least without, the glands connate or free. Umbels 4-flowered in panicles or corymbs, with large, usually oblongish bracts and bractlets. Limb of petals about orbicular, usually cochleate, not entire, more or less sericeous. Stamens unequal, styles more or less sigmoid. Samaras tardily partly free from pyramidal torus and with 5 or more scarcely developed to large longitudinal wings, variously winged, minutely or grossly, the wings ligneous to membranous, more or less united or distinct, subentire or deeply dentate.—The name from Greek refers to the double wings. The genus doesn't seem to be natural as delineated by Niedenzu.

Inflorescence densely crowded, gray puberulent.....*D. Uleana.*
Inflorescence open; pubescence reddish-brown.....*D. involuta.*

Diplopteris involuta (Turcz.) Ndz. Pflanzenreich IV. 141: 226. 1928. *Stenocalyx involuta* Turcz. Bull. Soc. Nat. Mosc. 31: 393. 1858. *Tetrapteris*(?) *includens* Benth. Lond. Journ. Bot. 7: 133. 1848(?). *D. includens* (Benth.) Ndz. l.c.(?).

A robust liana, the new parts including the ample paniculate inflorescence rusty or coppery sericeous, the branchlets and peduncles ancipitate; petioles finally glabrate, deeply canaliculate above, to 2.5 cm. long; stipules minute, membranous, affixed to each side of petiole base; leaves typically oblong or oblong-lanceolate, acute or obtuse at base, acute or abruptly and shortly acuminate, to about 23 cm. long, 7.5 cm. wide or much smaller, little if at all revolute, coriaceous, eglandular, ashy puberulent becoming glabrate, the 7 primary nerves prominent beneath, the secondary and tertiary irregularly areolate; umbels many; bracts oblanceolate or spathulate-linear to 1 cm. long, the suborbicular-cymbiform bractlets about 7.5 mm. wide, borne immediately under the subsessile flowers, all sericeous both sides, the umbel-peduncles 2–5 mm. long, the floriferous to nearly 15 mm. long; flowers 25–30 mm. wide, the spathulate-linear sepals strongly reflexed before anthesis, 8-glandular, sericeous both sides; petals spreading, yellow, silvery sericeous without, the oval crisply dentate limb 14–18 mm. long, the smaller suborbicular one long-ciliate; stamens unequal, the thick ones pubescent, the anthers obovoid, lanate at base with gland-thickened connectives; styles slender, sigmoid-recurved, 2 uncinate; ovary lanate; samara except ovoid nut glabrate, the primary lateral wings suborbicular, apically acutely incised to nut, sinuate, 6–8 cm. broad, the dorsal semiorbicular to 2.5 cm. long, the intermediate on both sides simple or in 1–2 series both directions, the ventral surface also with lateral winglets connate into a lacerate one.—Var. *ovata* Ndz. l.c. page 227, ovate leaves shortly and abruptly acuminate to 15 cm. long, 9 cm. wide, may be *T. includens* Benth., fide Niedenzu. Illustrated, Pflanzenreich, l.c. page 235 (flowers and fruit). F.M. Neg. 12715.

Loreto: Mouth of the Santiago, *Tessmann 4564*. San Antonio, flood-free woods, *Tessmann 4931* (both the var.). Brazil; Venezuela; Cayenne?

Diplopteris Uleana Ndz. Arb. Bot. Inst. Lyc. Brunsb. 4: 18. 1912; 227.

Liana, the canaliculate branchlets at first sericeous, finally glabrate, the prominent leaf nerves all parallel and regularly areolate; petioles sericeous, eglandular, to 4 cm. long; stipules minute, affixed to petiole at base, membranous as the leaves, these oval, ovate or obovate, more or less obtuse at base, acutely and rather abruptly acuminate, to 2 dm. long, 12.5 cm. wide, with 6 (or fewer) orbicular

black glands beneath 1 cm. distant from the erevolute margins; dichasia to 1 dm. long in bracted axillary panicles, peduncles densely velutinous with 2-forked trichomes, 2.5 cm. long, acuminate bracts and obtuse bractlets roseate, about 1 cm. long, contracted at base into short petiole; flowers 13 mm. wide, the sepals velutinous both sides, linear-oblong, the glands more or less connate with them; petals including the 3(–5) mm. long claw velutinous without, the ovate subentire limb 3(–5) mm. long; stamens unequal, anther connective slender; styles more or less sigmoid; samara golden sericeous (sparsely and gray in herb.), the 2 lateral wings confluent at base into 1, to 9.5 cm. wide, 4 cm. high, repand or sinuate, the 3 dorsal semiorbicular, a few mm. to 2.5 cm. high; seed ovoid, nearly 1 cm. long.—F.M. Negs. 12718; 23018 (fruiting).

San Martín: Tarapoto, *Spruce 4647; 4950*, part; *Williams 6603*. Pongo de Cainarachi, *Ule 6347*.—Loreto: Mouth of the Santiago, flood-free woods, *Tessmann 4611*.

5. HETEROPTERIS HBK.

Lianas, rarely erect shrubs with usually petioled, often glandular opposite leaves, inconspicuous stipules, the racemose or corymbose small flowers mostly disposed in panicles, the pedicels equaling, rarely exceeding, the peduncles, the fruit samaroid with the lower margin of the dorsal wing thickened, the upper edge thin. Sepals usually biglandular and eglandular in the same species. Petals often entire, always as the 10 stamens glabrous, these usually subequal, all fertile monadelphous at base, the anthers unappendaged. Styles free, obtuse, rounded dorsally or acute or uncinate. Cotyledons little unequal.—The name from the Greek means appropriately "diverse wing," and has been conserved.

Flowers not yellow; leaves oval, rounded or apiculate at apex, coarsely reticulate-veined; sepals flat.

Leaves conspicuously pilose beneath..... *H. Beecheyana.*

Leaves soon glabrate beneath..... *H. cristata.*

Flowers yellow or yellowish; leaves never entirely as above.

Sepals plane; leaves pubescent beneath or, if glabrate in age, the petioles slender and elongating.

Leaves broader than 2.5 cm., never narrowly oblong or narrowly oblanceolate.

Petioles 1.5–4 cm. long; leaf pubescence closely appressed or lacking.

Petals crenulate; petioles biglandular..... *H. transiens.*

Petals entire except 1; petioles eglandular.... *H. anomala.*

Petioles 3–10 mm. long; leaf pubescence loose or sericeous.

Leaves often serially glandular, sericeous.. *H. macrostachya.*

Leaves biglandular, tomentose..... *H. tomentosa.*

Leaves at most 2.5 cm. wide, oblong or oblanceolate. *H. catingarum.*

Sepals soon more or less revolute or recurving; leaves often glabrous, the petioles usually short and stout, 4–9 mm. long or rarely some about 15 mm. long; species at least in Peru obscurely defined.

Anthers subspheroid, the dark connective glabrous.

Pedicels often scarcely 2(rarely –4) mm. long.....*H. nervosa.*

Pedicels 3–6 mm. long..... *H. orinocensis.*

Anthers oval, bicolor, the yellow upper part typically piliferous. *H. grandiflora.*

Heteropteris anomala Juss. Ann. Sci. Nat. sér. 2. 13: 273. 1840; 357.

Liana with the young branchlets, peduncles and new leaves ferrugineous-sericeous with lustrous trichomes, the grayish branches terete and tuberculate-lenticellate; petioles glabrate, slender, to 4 cm. long, more or less curving; leaves broadly ovate or subrotund to obovate, obtuse or rounded to somewhat cordate at base, long-acuminate or apiculate, rounded or even deeply emarginate apically, to 18 cm. long, 13 cm. wide, glabrate in age (typically), chartaceo-coriaceous, smooth and dull above, sublucid beneath, the 8 primary nerves prominent, the secondary reticulate, both, as the revolute margins, minutely or obsoletely glandular or ciliate; umbels sessile, the terminal panicles ample, elongate; subulate bracts to 6 mm. long, pedicels 8 mm. long, involucrate bracts and bractlets semiorbicular, 1 mm. long; flowers yellow, 15 mm. broad; sepals straight, rotund-ovate, carinate, eglandular or glandular, scarcely 3 mm. long; petals spreading, deeply cochleariform, the fifth denticulate, 4–5.5 mm. long with claw 3–3.5 mm. long; anthers oblong, 1.5–2 mm. long; styles produced apically; samara unknown.—The Peru plant is var. *aurea* Ndz., leaves golden sericeous beneath, retuse; the allied *H. argyrophaea* Juss., 355, of Ecuador and Brazil, has smaller

permanently sericeous (beneath) leaves on short petioles biglandular at base, smaller flowers with denticulate petals, shorter anthers. Illustrated, Pflanzenreich, l.c. page 347. F.M. Negs. 24257; 12755 (var.).

San Martín: Juan Guerra, *Williams 6850.* Tarapoto, *Williams 5456.* Juanjuí, *Klug 4328* (? young).—Loreto: Flood-free woods at the mouth of the Santiago, *Tessmann 4511;* also at Puerto Meléndez below Pongo de Manseriche, *4785.* Near Iquitos, *Killip & Smith 26918.* On the Huallaga, *Williams 6525; 6818.* Brazil.

Heteropteris Beecheyana Juss. Ann. Sci. Nat. sér. 2. 13: 278. 1840; 308. *Banisteria tomentosa* Schlecht. Linnaea 10: 244. 1836, not *H. tomentosa* Juss., 1832. *H. tomentosa* Hook. & Arn. Bot. Beechey Voy. 281. 1836. *B. Beecheyana* (Juss.) C. B. Robins. N. Amer. Fl. 25: 134. 1910.

Small liana, the terete divaricate branchlets somewhat rusty tomentose and whitish tuberculate-lenticellate as the glabrate branches; petioles 3–9 mm. long, typically eglandular; leaves ovate, oval or obovate, obtuse or subcordate at base, sometimes obliquely, obtuse or retuse and mucronate apically, typically to 7 cm. long, 4 cm. wide, marginally revolute, chartaceous, early both sides and in age beneath lutescently tomentose, often rugose, the nerves impressed above, prominently reticulate and with 2–6 black glands above the base below; umbels 4–6-flowered rusty tomentose in terminal and axillary leafy panicles, the umbel peduncles 3–15 mm. long, the canaliculate floral 4–6 mm. long, the pedicels 2–4 mm. long, bracts and bractlets ovate, 1–2 mm. long; flowers 10–12 mm. across, the oval carinate straight sepals 6–10-glandular; petals reddish, entire, medially carinate, the limb 4 mm. long, the shorter fifth one glandular-ciliate, 7 filaments about one fourth connate; styles compressed dorsally and ventrally; samara nut with 1–3 dentate lateral crests, the dorsal wing obliquely obovate, 2–2.5 cm. long, 10–14 mm. wide.—The Peruvian variant is *andina* Ndz., the oblong leaves to 7.5 cm. long, 3.5 cm. wide, petioles 1–1.25 cm. long with 1 sessile or rarely stiped gland below the apex. It is *Banisteria glandulosa* Ruiz mss. fide Griseb. Linnaea 22: 21. 1849, including *B. rubiginosa* Juss., 223 (477), fide Griseb. l.c.—Illustrated, Pflanzenreich, l.c. page 308. F.M. Neg. 24259.

Junín: Palca, *Ruiz & Pavón.* Bolivia to Mexico and Venezuela.

Heteropteris catingarum Juss. Arch. Mus. Paris 3: 443. 1843; 352.

Said to be a small tree, the inflorescence branches and newer parts reddish tomentulose, the ashy rugulose branches with a few concolored lenticellae; petioles tomentose, 5–14 mm. long; leaves oblong or oblanceolate, acute or cuneate at base, obtuse, rounded or emarginate at apex, 1.5–5.5 cm. long, 5–25 mm. wide, the subcrenate margins strongly revolute, the adult glabrate, chartaceous, dull and smooth above, golden or ashy tomentose beneath unless the prominent midnerve; umbels usually 4-flowered, often with 2 additional flowers a little distant, or corymbs 6-flowered, borne in simple panicles, the umbel peduncles to 3 mm. long, floriferous obsolete, pedicels 5–7 mm. long, lanceolate-linear umbel bracts 3–4 mm. long, the floriferous bracts and bractlets ovate, acute, 1.25 mm. long; flowers yellow, 1 cm. wide, the sepals typically eglandular, ovate, 2.5 mm. long, the curved cochleate-obovate petals entire, 3–3.5 mm. long with claw 2–2.5 mm. long; anthers oval, glabrous, 1 mm. long on unequally thick filaments; styles arcuate, acute dorsally at tip; samara unknown.—The Bües specimen might prove to be the related *H. transiens;* cf. also *H. macrostachya* and remark. Also to be expected is the similar *H. pauciflora* Juss., page 351, known now from Colombia, Brazil and Argentina; it has thinner, more lanceolate, mostly acuminate leaves and nearly straight styles rounded dorsally at tip. F.M. Neg. 21335.

Cuzco: Valle de Santa Ana, Rosalina, 650 meters, (*Bües*). Brazil (Bahia).

Heteropteris cristata Benth. Lond. Journ. Bot. 7: 131. 1848; 315.

Liana with branches roughened by the tuberculiform lenticels, the branchlets and more or less leafy inflorescences reddish pubescent, soon glabrate; petioles to 1 cm. long typically biglandular at base; leaves ovate from rounded base, somewhat obliquely acute or obtusely acuminate, to about 13 cm. long, nearly half as wide, chartaceous-coriaceous, the adult finally glabrate (or glabrous in Peru), concolor, prominently nerved and reticulately veined in the type with a series of glands a distance from the nearly plane margins; corymbs 8-flowered, the terminal subsessile, the lateral with 1 cm. long peduncles bibracteolate below the apex, the pedicels enlarged, the bracts and bractlets 1–2 mm. long; flowers 12 mm. broad with ovate apically rounded glandular sepals and all 5 roseate petals winged-carinate (this carination nearly 2 mm. high); anthers ovoid at least 1.5 mm. long; samara glabrate with oblong-falcate wing about 2.5 cm. long

and lateral irregularly lobed crests 2–4 mm. high.—The Peruvian collection does not seem ex char. to be typical but the species is probably variable enough to include it; indeed an earlier name, sens lat., may be *H. rufula* Juss., 314, the petal carination half as high, the samaras puberulent with lacerate-dentate lateral crests. Illustrated (flower), Pflanzenreich, l.c. page 308. F.M. Neg. 12762.

Loreto: Florida, Río Putumayo at mouth of Río Zubineta, *Klug 2153* (det. Morton). Brazil to British Guiana; Colombia. "Aiquio" (Huitoto).

Heteropteris grandiflora Juss. Arch. Mus. Paris 3: 461. 1843; 364.

Allied and apparently very similar to *H. orinocensis;* leaves oval, obovate or oblong, to 11 cm. long, 5.5 cm. wide; racemes in axillary and terminal, the latter rather ample, panicles; bracts and bractlets 2–2.5 mm. long; petals orbicular, 4 or 5–7 mm. long; anthers oval, the lower portion of the dark connective glabrous, the upper yellowish piliferous; styles acutely angled at tips, rarely rotund or shortly uncinate; samara wing little ascending, semiobovate, more than 2.5 cm. long, more than 1 cm. wide, the upper margin produced into an appendage 6 mm. long, 2 mm. high.—F.M. Neg. 24262.

Loreto: Inundated areas at Itaya, (*Tessmann 5135*). Brazil.

Heteropteris macrostachya Juss. Ann. Sci. Nat. sér. 2. 13: 275. 1840; 342.

Scandent, the complanate branchlets reddish-sericeous, the branches finally glabrate, often striate and lenticellate; petioles scarcely exceeding 1 cm. long, biglandular medially; leaves ovate, oblongish or obovate, obtuse or rounded to somewhat cordate at base, acuminate or apiculate, to 2 dm. long, about half as wide, typically coriaceous, glabrate and lustrous above, brownish-metallic sericeous beneath and serially glandular parallel to the margins where obsolete; 2–4-flowered umbels closely disposed in elongate leafy panicles, the peduncles and pedicels 3–4(–6) mm. long, the ovate apically rounded bracts and bractlets 1–1.5 mm. long; flowers yellow, 12–14 mm. broad, the sepals with 8 oblong or curved more or less merged glands, the ovate limb of the fifth petal glandular above straight claw; filaments connate one third or more, the glabrous anthers 1.5–2 mm. long; styles equal, short, thick, little dilated at apex, dorsally acute; samaras 2(3), sericeous, nut subglobose, 1 cm. wide, wing to 6 cm. long or longer, 2.5 cm. wide, in forma *transiens* Ndz. strongly

constricted above the base, this being the Peruvian plant further distinct by the somewhat thinner (chartaceous) leaves.—The West specimen in fruit may not belong here; cf. also the doubtful specimen by Bües, not seen, referred to *H. catingarum* but from the same region. The West specimen seems to lack leaf glands; the samaras are densely rusty pubescent at base, the wing only 2–3 cm. long, 1 cm. wide, but the fruit apparently mature. F.M. Negs. 35589; 24265; 12767 (last two, forma).

San Martín: Tarapoto, *Spruce 3947.*—Cuzco: Savannah brush at river sides, 1,000 meters, *West 7196* (det. Johnston). To Central America, Amazonian Brazil and the West Indies.

Heteropteris nervosa Juss. in St. Hil. Fl. Bras. 3: 26. 1832; 369. *H. suberosa* Willd. ex Griseb. Linnaea 13: 229. 1839. *H. anoptera* Juss. Ann. Sci. Nat. sér. 2. 13: 276. 1840, fide Kosterm. Med. Bot. Mus. Rijks Univ. Utrecht 25: 6. 1936. *Banisteria suberosa* Willd. var. *Candolleana* (Juss.) Morton, Proc. Biol. Soc. Wash. 43: 158. 1930. *B. nervosa* (Juss.) R. O. Williams, Fl. Trin. & Tob. 1: 133. 1929; also var. *Candolleana* Ndz. ex Williams, l.c. and var. *Lessertiana* Griseb. ex Williams, l.c.

Liana, or sometimes apparently a small tree with the general characteristics of the related *H. orinocensis* but the branches thickly tuberculate with smaller lenticels, the leaves chartaceous-coriaceous, the nervation rather prominent also above, the peduncles and pedicels somewhat stouter and the styles dorsally to 0.5 mm. long, uncinate; leaves sometimes broader, often larger even to 2.5 dm. long, 9 cm. wide, minutely sericeous beneath; flowering peduncles and pedicels 1–2 mm. and 2–4 mm. long; styles long-uncinate, especially the shorter straight anterior one; samara wing subobovate, to 4.5 cm. long, 1.5 cm. wide, the sigmoid inner edge with obtuse appendage at base 6 mm. long.—The distinctions appear to be relative and perhaps only one species is concerned; the var. *Lessertiana* (Juss.) Macbr. Field Mus. Bot. 8: 120. 1930, is merely the state with glandular calyx. F.M. Negs. 35591; 12799 (*H. suberosa*).

San Martín: Tarapoto, *Ule 6706; Spruce.*—Junín: La Merced, 1,000 meters, *Weberbauer 1840;* 282.—Loreto: Near Iquitos, *Tessmann 3578; 5539.*—Río Acre: Mouth of Río Macauhán, *Krukoff 5750* (det. Ndz.). Bolivia to Panama and the West Indies.

Heteropteris orinocensis (HBK.) Juss. Ann. Sci. Nat. sér. 2. 13: 276. 1840; 367. *Banisteria*(?) *orinocensis* HBK. Nov. Gen. &

Sp. 5: 162. 1822. *H. acutifolia* Juss. l.c. 276. *H. Mathewsana* Juss. l.c. 245, ex char.

Scandent or apparently also erect, typically said to be glabrous but usually the younger compressed branchlets and new leaves rufous subsericeous, the terete branches glabrate and coarsely tuberculate-lenticellate, robust; petioles rather stout, glabrous, 4–6 mm. long; leaves oblong or lanceolate, acute to subcordate at base, usually long-acuminate (acumen sometimes 3 cm. long), rigid-coriaceous, to 16 cm. long, 6 cm. wide or larger, soon glabrate, very smooth and often lustrous above, the larger prominent nerves and the approximate secondary intricately reticulate and somewhat glandular; racemes to 16-flowered, the rather slender flowering peduncles and pedicels 3–6 mm. long, the bracts and bractlets ovate or lanceolate, about 7 and 3.5 mm. long; flowers yellow, 13–17 mm. broad, the lanceolate sepals glandular or eglandular, the crisply crenulate petals 4–6 mm. long with claw 2–4 mm. long; styles shortly uncinate dorsally; samara as known with puberulent nut, the obovate wing there geniculate and obliquely ascending to 3.5 cm. long, 1.75 cm. wide, the upper margin produced.—The type described as glabrous and its identity with *H. acutifolia* not regarded as certain by Niedenzu; the above description is his for the Jussieu plant, var. *eglandulosa* (Juss.) Ndz., to which the fruit belongs. The use of the HBK. name as earliest dissolves the question of priority as regards the other names. According to Grisebach the species should include *H. Candolleana* (*H. nervosa*) and *H. carinata* Benth. *H. Mathewsana* Juss., 379, seem to be affine, fide Niedenzu. F.M. Negs. 19372; 35576 (both *H. acutifolia*, vars.).

Junín: Vitoc, *Ruiz & Pavón.*—San Martín: Tarapoto, (*Mathews 1465*, type, Herb. Hook., *H. Mathewsana*). Brazil; Colombia; Venezuela; Yucatan(?)

Heteropteris tomentosa Juss. in St. Hil. Fl. Bras. 3: 31. 1832; 324. *H. spectabilis* Juss. Ann. Sci. Nat. sér. 2. 13: 274. 1840.

Branchlets reddish tomentose, the finally glabrate branches densely tuberculate, to 5 mm. thick; petioles 3–6 mm. long, tomentose; leaves ovate or obovate, more or less cordate, acute and often rather long-acuminate, to 13 cm. long, 8 cm. wide, the floral bractiform, lanceolate, biglandular, scarcely 5 mm. long; smaller oblanceolate younger sericeous both sides, adult plane, glabrate or puberulent above, smooth or nearly, lucid, beneath yellowish or ashy tomentose, the prominent nerves reticulate and with 2 dark glands at base; umbels or corymbs 4–10-flowered, floriferous peduncles below the

middle or about the middle bibracteolate, 3–5 mm. long, pedicels 4–8 mm. long, bracts and bractlets rarely acute, 1–2 mm. long; sepals ovate, rounded carinate; petal limb obtuse or rounded, often crisped, carinate below; anthers oblong-oval, cells parallel, 1.5–2 mm. long, styles apically rounded or acute and somewhat uncinate; samara subtomentose, the nut ovoid, the wings obliquely oblong-obovate or falciform to 3.5 cm. long, 1.7 cm. wide, upper margin sigmoid and at base in rounded appendage to 1 cm. long produced.—F.M. Neg. 19391.

Huánuco: Pillao, (*Woytkowski 34062*, form, det. Cuatrecasas).—Junín: Chanchamayo, *Raimondi* (det. Herb. Dahlem). To Paraguay and Brazil.

Heteropteris transiens Ndz. Arb. Bot. Inst. Lyc. Brunsb. 2: 39. 1903; 354.

Liana, the younger compressed branchlets and inflorescences reddish sericeous, the branches glabrate, terete, striate or rugose, finally canescent and to 4 mm. thick; leaves ovate or oblong-ovate, usually obtuse or rounded at base, long-(acumen to 4 cm. long) and acutely acuminate, 8–20 cm. long, half as wide, nearly plane, chartaceous-membranous, soon glabrate both sides, not only the 6–10 primary nerves but also the secondary parallel crowded and rather prominent, densely areolate; petioles glabrate, biglandular at base, often voluble, 1.5–3.5 cm. long; floral leaves all reduced to linear bracts 2–7 mm. long, the 4-flowered umbels or 6-flowered corymbs sessile or shortly peduncled and disposed in twice compound axillary and terminal panicles; flowers yellow, about 14 mm. wide, the ovate to lanceolate straight sepals eglandular or with 8 oval or suborbicular glands, the crenulate petals 3.5–5 mm. long, cuneate to the short strongly reflexed claw; stamens unequal, the oval anthers 1–1.5 mm. long; styles long-pediform-uncinate, the sigmoid posterior much thicker than the nearly straight anterior; samara not known.—Apparently rare or seldom collected; or perhaps an entity not stabilized. The forma *glandulifera* Ndz. has also been found in eastern Brazil. F.M. Negs. 12706; 12779; 32423 (forma).

Loreto: Flood-free rain forest at the mouth of the Río Santiago, (*Tessmann 4721*). Brazil (Rio de Janeiro).

6. BANISTERIA L. sens. Juss.

Essentially *Heteropteris* but the upper margin of the dorsal samara wing thickened, the lower edge thin. Flowers much more

often roseate. Styles mostly equal, simply truncate at tip, the terminal stigma usually capitellate. Sepals infrequently eglandular. —*Banisteriopsis* C. B. Robins. ex Small, N. Am. Fl. 25: 131. 1910 has been proposed to supplant the Linnaean name on the ground that the latter was based on species now assigned to other genera. It would seem preferable, especially since there is much precedence, to add the name in the long-used sense to nomina conservanda, as proposed by Kostermans in Med. Bot. Mus. Rijks Univ. Utrecht 25: 7. 1936. As the name *Heteropteris* Kunth, based on the type species of Linné's genus *Banisteria*, belongs to the nomina conservanda and *Banisteria* L. has been rejected, Intern. Rules ed. 3. 135. 1935, it appears advisable to make *Banisteria* L., sens. Juss. a nomen conservandum and *Banisteriopsis* C. B. Robins. ex Small a nomen rejiciendum. The action already taken need not preclude this practical if expedient solution to assure here generic stability, so clearly desirable, as observed, Field Mus. Bot. 8: 120. 1930. It is a historic fact that law is subject to change to suit developments. The name commemorates John Banister, English missionary (circa 1700) and author of the first(?) catalogue of the plants of Virginia.

Banisteria caapi and variants are the source of a narcotic (cf. under that species below). J. T. Baldwin, Jr., Bull. Torrey Club 73: 282–285. 1946, recorded the 2*n*-number as 20.

As suggested by J. T. Baldwin, Jr., Bull. Torrey Club 73: 282–285. 1946, one of the best short accounts of the effects of the alkaloid which this plant yields is by Louis Lewin under the title "Phantastica, narcotic and stimulating drugs," New York, 1931, from the German second edition by P. H. A. Wirth; an extensive bibliography is given in Pflanzenreich, l.c. 437, including a good paper by Perrot and Raymond-Hamet, Compt. Rend. Acad. Sci. Paris 1266. 1927 and one by Lewin, l.c. 469. *pl. 186.* 1928; cf. also the observations of G. Klug as reported by Morton, Journ. Wash. Acad. Sci. 21: 487–488. 1931. Baldwin himself describes well the extreme excitation of the drug on the nervous system, the user often being transported, according to all accounts, into a world of pleasurable fantasy.

The drug, variously known as "telepathin," "yagein," or "banisterine," is found in a number of related plants or forms, notably *B. quitensis* and *B. inebrians*, and Baldwin's remarks are quoted with pleasure: "Though I know nothing of the merits of specific segregation in this particular aggregate it is my impression that many groups of tropical plants are over-named through a lack of understanding of [their] genetic variation.... From my own ex-

perience with *Hevea* I judge that numerous Amazonian species undergo introgressive hybridization with resultant difficulties for herbarium studies and that many species in that region are . . . ecotypes . . . frequently accorded binomial recognition." However I would add that we would not make this error so often if we would refrain from giving specific value to characters obviously occurring in almost infinite variation within a group; specifically, here the presence or absence of glands is probably a good example.

For convenience the key is artificial; the species are not yet well-placed or well-known, but the significant characters appear to be mostly in the styles and fruits; gland development anywhere is probably variable and it is possible that elongate inflorescences may bear only one or few fruits at lower nodes, giving herbarium material a very different aspect in fruit than in flower.

Leaves obviously pubescent beneath even when mature; petals glabrous, unless *B. heterostyla*.

Leaves subsessile; flowers yellow; styles stout, straight, equal. *B. laevifolia*.

Leaves petioled; styles diverging or sigmoid, slender, usually unequal.

Styles sigmoid, nearly equal, setose; flowers yellow; secondary nerves reticulate, the lateral subparallel. . . . . *B. leiocarpa*.

Styles glabrous or anterior basally sericeous, unequal; flowers red or reddish (and white); secondary nerves parallel.

Leaves lanceolate or narrowly ovate; anterior style pilose; nut alulate. . . . . *B. heterostyla*.

Leaves broadly ovate; styles glabrous; nut usually rugose-aculeate.

Pubescence moderate; pedicels slender. . . . . *B. muricata*.

Pubescence lanuginose; pedicels stout. . . . . *B. oxyclada*.

Leaves soon glabrous or glabrate, even beneath, unless rarely sparsely puberulent especially the nerves, the undeveloped only in *B. cristata* densely sericeous.

Petals somewhat sericeous (unknown in types of *B. peruviana*, *B. inebrians*); flowers in simple or subsimple inflorescences often much shorter than the leaves.

Leaves puberulent beneath; styles subequal, rather straight, glabrous. . . . . *B. nigrescens*.

Leaves glabrous beneath or with few scattered trichomes unless the midnerve; styles more or less barbate.

Anthers densely lanate or pilose; samara nut lacerate-lobulate (known).

Leaves caudate, membranous; styles pubescent at base. *B. caduciflora.*

Leaves long-acuminate, firm; styles exserted, unequally barbate..... *B. lucida.*

Anthers glabrous or puberulent; styles unequally barbate; species indefinite as known.

Samara nut rugulose, even deeply or lamellately; leaves chartaceous.

Anthers glabrous; leaves minutely pilose beneath, plane or nearly; nut about 5 mm. wide..... *B. nutans.*

Anthers puberulent; leaves glabrate, minutely revolute.

Nut about 5 mm. wide..... *B. inebrians.*

Nut about 15 mm. wide..... *B. peruviana.*

Samara nut alulate; leaves often firm or coriaceous.

Anthers glabrous; leaves minutely revolute and glandular. *B. pubipetala.*

Anthers puberulent each end; leaves eglandular, plane. *B. platyptera.*

Petals glabrous (unknown in types of *B. longialata, B. peruviana, B. inebrians*); flower clusters often disposed in more or less leafy or leafy bracted axillary or (and) terminal panicles often as long as or longer than the leaves.

Young leaves densely long-sericeous; flowers more or less precocious..... *B. cristata.*

Young leaves soon glabrate or puberulent; flowers with mature leaves.

Flowers mostly racemose or corymbose in dense short inflorescences or terminal panicles..... *B. cornifolia.*

Flowers mostly umbellate (except *B. padifolia*) in rather open, sometimes elongating inflorescences.

Leaves oblong-lanceolate; secondary nerves parallel. *B. padifolia.*

Leaves elliptic or if ovate-lanceolate, broadly; secondary nerves usually reticulating with the veins.

Leaves coriaceous, rounded at base, drying brown or reddish at least beneath; styles glabrous; nutlets smooth or nearly.....*B. leptocarpa.*

Leaves membranous-chartaceous, usually drying dark and somewhat acute at base; nutlets crested-alulate.

Styles barbate; wing 5–6 cm. long, the nut conspicuously alulate.....*B. longialata.*

Styles glabrous or nearly; wing 2.5–3.5 cm. long (all, apparently, *B. caapi*, sens. lat.).

Stipules minute; styles subequal or the anterior shorter.

Anthers described as puberulent, petioles as apically glandular.....*B. peruviana, B. caapi.*

Anthers glabrous; petioles as leaves usually eglandular.....*B. quitensis.*

Stipules larger; anterior style stouter and longer than the posterior.....*B. inebrians.*

Banisteria caapi Spruce ex Griseb. Fl. Bras. 12, pt. 1: 43. 1858; 436. *Banisteriopsis caapi* (Spruce) Morton, Journ. Wash. Acad. Sci. 21: 486. 1931.

Liana, the younger parts minutely appressed sericeous, mostly soon glabrate except the slender inflorescences silvery sericeous with short dense indument; branches minutely lenticellate, the shoots to 4 mm. thick; stipules minute; petioles canaliculate above, sericeous, 1–1.5 cm. long, with 2 large orbicular glands at apex; leaves ovate-lanceolate, rounded at base, acuminate (acumen 2–3 cm. long), to 17 cm. long, 6–9 cm. wide, glabrate, lustrous and nearly smooth above, the 5–6 primary nerves prominent beneath, the secondary obscurely areolate, usually with 2–4 seriate marginal glands; panicle leaves acute with large glands, to 3.5 cm. long; umbel peduncles 5–15 mm. long, pedicels 10–18 mm. long; bracts and bractlets 1.5–2 mm. long; flowers pale rose, 15–17 mm. wide, the ovate acuminate sepals often recurved, silvery pruinose, glandular, the petal limb strongly concave, oval, fimbriate-glandular; filaments very unequal, 2 much longer; anthers puberulent; styles sigmoid, 2 stouter; nut nerves extended as in *B. argentea*, the dorsal wing to 3.5 cm. long, 6–7 mm. wide above the base, 16–17 mm. wide below the apex.—F.M. Neg. 24326.

This with *B. quitensis* Ndz. and other similar members of this family contains an alkaloid, "telepathin" or "yagein" or "bani-

sterine," extremely exciting to the nervous system; cf. Pflanzenreich, l.c. page 437, for bibliography including Compt. Rend. Acad. Sci. Paris 469. *pl. 186*. 1928 and l.c. page 1266. 1927. Found in Ecuador at same locality as *B. quitensis*, also said to grow in Peru, and perhaps distinguishable by the puberulent anthers.

The original of *B. caapi* was from Ecuador (same locality as *B. quitensis*). All the material seen is sterile; determinations, except as noted, by Standley. Spruce found it cultivated in many places; Killip & Smith at Iquitos; the corded twisting stems attain a diameter of several centimeters.

Madre de Dios: Iberia, near Río Tahuamanu, *Seibert 2173* (det. Morton).—Loreto: Río Nanay, *Williams 330; 821* (former matched *Tessmann* sterile specimens at Dahlem, det. Ndz. *B. quitensis*). Río Itaya, *Williams 3348; 3523*. Iquitos, *Williams 3741; 8111; 8224; Killip & Smith 27385; 29825*. Ecuador; Colombia; Amazonian Brazil. "Capi" (Ducke), "yage," "ayahuasca," "punga-huasca."

Banisteria caduciflora Ndz. Ind. Lect. Lyc. Brunsb. 22. 1901; 448.

Liana, the canaliculate compressed branchlets and terete branches soon glabrate, smooth, brownish, slender, scarcely 3 mm. thick; stipules minute, annulate at base; petioles eglandular, 4–7 mm. long; leaves oblong or lanceolate, obtuse at base, abruptly and obtusely long (about 1 cm.)-acuminate, 3–9 cm. long, mostly 1–3 cm. wide, plane, membranous-chartaceous, soon glabrous both sides and, especially beneath, densely nervose (primary nerves 8–10, crowded), reticulate with 6–12 biseriate glands equidistant from midnerve and margin; corymbs simple or often trifid, sericeous, the common peduncle to 1.5 cm. long, pedicels slender, to 2 cm. long, bracts linear-lanceolate, 2 mm. long, bractlets 1.5 mm. long; flowers scarcely 1.5 cm. wide, the orbicular sepals glandular, the petals, especially the fifth, oval, long-fimbriate, claws 2–2.5 mm. long; anthers densely lanate, the connective exceeding cells both sides; stamens and styles short, scarcely 3 mm. long, barbate at base; fruit not known.—Nearly *B. erianthera* Juss., 448, of Amazonian Brazil, the leaves gradually caudate-acuminate, the styles elongate, the anterior nearly entirely barbate, the posterior to the middle; cf. also *B. lucida*. High-climbing woody liana with arm-thick apparently winding stems (Weberbauer), in open woods. F.M. Neg. 12805.

Junín: La Merced, 1,000 meters, *Weberbauer 1918;* 282.—Loreto: Woods near Yurimaguas, *Poeppig 2474*, type.

Banisteria cornifolia (HBK.) Spreng. Syst. 2: 388. 1825; 404. *Heteropteris*(?) *cornifolia* HBK. Nov. Gen. & Sp. 5: 165. 1822. *B. cinerascens* (Benth.) Griseb. var. *glabrescens* Ndz. l.c. 406.

Liana, with usually axillary simple or compound corymbs of rather small yellow flowers borne on slender appressed strigillose pedicels 6–10 mm. long or the inflorescence said sometimes to be terminal, leafy; branches typically somewhat strigose or glabrous in age, more or less lenticellate; petioles 4–8 mm. long; leaves lanceolate to elliptic, acutish at the rounded base, more or less acuminate, often to about 9 cm. long, 4 cm. wide, or in Peru larger, glabrous or nearly in age and prominently reticulate veined, especially beneath; flowers 10–14 mm. wide; sepals ovate, the glands large; stamens and styles glabrous, the latter nearly straight and subequal; petals glabrous, a little denticulate; samara puberulent especially about the nut, this somewhat tuberculate or short-alulate, the wing about 3 cm. long.—Apparently variable or not understood; the Klug specimen was determined by me as the variety of *B. cinerascens* (Benth.) Griseb. because it seemed to match its type, *Ule 9477*, which, likewise only in flower, apparently differs only in the smaller leaves that dried fuscescent, those of Klug being dark and nearly 1.5 dm. long, about half as wide; nevertheless it seems probable that they represent one entity which may be a variant of *B. cornifolia*. Here would key two aberrant specimens that are probably distinct and perhaps represent an undescribed species: *Seibert 2122* from Iberia, Dept. Madre de Dios and *Krukoff 5300* from Río Macauhán (this det. A. C. Smith, *Mascagnia macrophylla*); the styles are basally ciliolate, the samara wing much shorter. For convenience they ought to have a name and appropriately may be designated *B. cornifolia* var. **Seibertii** Macbr., var. nov., styli ad basin ciliolati.—*Seibert 2122*, type. F.M. Neg. 21329 (not seen).

Loreto: Mishuyacu, *Klug 706*.—Río Acre: Seringal San Francisco, *Ule 9477* (type, *B. cinerascens* var. *glabrescens*). To southern Mexico and Venezuela.

Banisteria cristata Griseb. Linnaea 22: 16. 1849; 442. *B. lutea* Ruiz ex Griseb. Linnaea 22: 15. 1849; l.c. 443, at least as to Peru.

More or less erect but often climbing or clambering in other shrubs, the younger parts sericeous, the terete glabrate branches reddish rugulose and lenticellate, to 4 mm. thick; petioles pilose, usually less than 1 cm. long and with 2 black glands below the apex; leaves in so far as known ovate, apiculate to acuminate, early

especially beneath pubescent and tomentose, finally glabrate, to 9 cm. long, 5 cm. wide, the 3–5 primary nerves moderately prominent, reticulate; umbels solitary or 2–3 at enlarged nodes, the rachis scarcely more than 3 mm. long, slender pedicels 1– nearly 2.5 cm. long, lanceolate bracts and bractlets 1–1.5 mm. long; flowers 2 cm. broad; sepals elliptic, 3 mm. long; petals with subrotund glabrous fimbriate limb 6–7 mm. long, claw 3–4 mm. long; connective of larger glabrous stamens thickened; styles very unequal, 4–6 mm. long; samara puberulent especially near the 4–6-alulate nutlet, the wing at least in typical state to 3.5 cm. long, obovate-oblong with basal rounded-oblique anterior appendage about 7 mm. long, 5 mm. high. Flowers bright deep yellow, showy; semi-erect or leaning on shrubs, trees (West).—Probably should be drawn to include *B. praecox* Griseb., 443, *B. nitrosiodora* Griseb., with leaves of *Hiraea*, 442, the latter illustrated, Lilloa 9: *fig. 2.* opposite page 260. F.M. Neg. 12817.

San Martín: Tarapoto, *Spruce 4199.* Without locality, woods, *Ruiz & Pavón*, type.—Cuzco: Valle de Santa Ana, (*Herrera 1926*). Open deciduous savannah forest, 1,500 meters, Huadquiña, Prov. Convención, *West 7191* (det. Johnston). Dept. unknown: Quebrada Versalles, *Diehl 2434a.* Bolivia; Guiana?

Banisteria heterostyla Juss. Ann. Sci. Nat. sér. 2. 13: 283. 1840; 450.

Liana with compressed pulverulent-tomentulose branchlets, inflorescences, petioles and leaves beneath, glabrate smooth lustrous reddish branches 2–3 mm. thick; stipules minute, filiform, deciduous; petioles 5–10 mm. long with 2 small glands below the apex; leaves ovate-lanceolate, acute or obtuse at base, apiculate, to 6 cm. long and about a third as wide, little revolute, chartaceous, glabrate, smooth and lustrous above, drying brown, the floral rotund, much smaller; umbels terminating primary or secondary upper branchlets in the 2 upper leafy internodes, the pedicels 10–15 mm. long, bracts and bractlets ovate-lanceolate, hardly 1 mm. long; flowers red, about 2.5 cm. broad, the sepals eglandular, subrotund from a narrow base, the orbicular petal limb fimbriate, with claw 2–3 mm. long; stamens and styles both very unequal, the anthers glabrous with granular enlarged connective, the anterior style basally pilose; samara nut villous, scarcely 6 mm. high with 3 lateral wings, both sides sinuate or lacerate and nearly 1 cm. long, 3–4 mm. high, the wing to 3 cm. long, about 13 mm. wide, at base produced into a large rotund-tri-

angular appendage to 7 mm. long, 6 mm. high.—The Schunke specimen has not been re-examined and I think it may be questioned; it is more probably *B. pubipetala*, if the flower-color was wrongly noted. Illustrated, Pflanzenreich, l.c. page 444. F.M. Neg. 19360.

Junín: La Merced, *Schunke 306*. Colombia.

Banisteria inebrians Morton, Journ. Wash. Acad. Sci. 21: 485. 1931.

High climbing liana, the new branchlets finally 4 mm. thick, densely lenticellate, glabrate, terete, striate, the internodes 5–6 cm. long; petioles 10–12 mm. long, about 1.5 mm. thick, strigose, eglandular, deeply canaliculate above; stipules large, pubescent glands finally deciduous; leaves broadly elliptic, rounded at base, merely acute at apex, about 11 cm. long, 6.5 cm. wide, smooth, lustrous, olive-green above, concolor beneath, soon glabrate both sides except for a very few trichomes, but the midnerve and laterals prominent beneath where strigose, the base of the lower ones with 2 large glands, the secondary parallel nerves scarcely conspicuous; inflorescence axillary, little longer than 5 cm. in fruit, persistently pubescent, the umbel peduncles 12–14 mm. long; anterior style 3.5 mm. long, stouter and longer than the 2 posterior; samara nut early sericeous becoming strigose, oblong, only one side reticulate-rugose, the other biseriately alulate or aculeate, the dorsal wing broadly semiobdeltoid, the wing about 3.5 cm. long, 7 mm. wide at base, 16 mm. below the tip.—Morton contrasted his species with *B. caapi* and *B. quitensis* as follows: both with minute or small stipules, acuminate leaves, those of former glabrate, larger inflorescences, anterior style shorter than 2 posterior, samara wing oblong-obovate or obliquely oblong and smaller; and further from former, eglandular petioles, well-peduncled umbels and from latter, glandular leaves. The plant therefore seems to be an intermediate development but the flowers are unknown and the taxonomic importance of the characters noted not proved; certainly even with material accumulated now there appears to be variable concomitance in the distinctions stressed. On the other hand there may well be several entities, since Morton saw 60 specimens.

Morton, l.c. pages 487–488, quoted Klug's notes sent in with the type (Umbria, Colombia), describing the reported effects of the drug obtained by an all-day boiling of "yagé" (apparently *B. quitensis*, fide Morton), to which is added young shoots and leaves of "oco yagé" or "chagro panga" (these, fide Morton, much like those of

B. Rusbyana Ndz. 445; see also *B. longialata*); it is thought that the addition of these may account for the "bluish aureole" accompanying visions experienced by some drinkers.

Peru (probably). Colombia. "Yagé del monte."

Banisteria laevifolia Juss. in St. Hil. Fl. Bras. 3: 38. 1832; 414.

Rather low shrub, erect and with virgate branches or scandent, the branchlets terete, finally glabrate; leaves ovate or elliptic or obovate to lanceolate, more or less cordate at base, acute or acuminate, to 11 cm. long, 4–7 cm. wide, smooth or the nerves and reticulation obvious above, golden or silvery sericeous beneath, often sparsely so in age with 2–4(–8) glands near midnerve or base; petioles scarcely 1–2 mm. long; stipules minute; umbel peduncles 5–10 mm. long, the pedicels about as long to much longer, bracts ovate, bractlets lanceolate, 1–nearly 2 mm. long; flowers 15 mm. wide; sepals suborbicular, acuminate, the glands thick, oval or obovoid; petals keeled at base, the limb concave, 6–8 mm. long, ciliate-glandular, the fifth one plane, 5 mm. wide; anthers glabrous; styles laterally compressed; samara wing obliquely obovate, to 2.25 cm. long, 1.25 cm. wide, the simply rugulose nut 7 mm. high, 5 x 4 mm. in diameter. —The Peru plant is var. *grata* (Griseb.) Ndz., scandent, leaves 4–8-glandular, the adult rubescent beneath, the pubescence rarely on the younger golden becoming sparse on the older lower ones; pedicels more slender, to 1.5 cm. long. Illustrated, Pflanzenreich, l.c. page 415 (stamens and style). F.M. Neg. 12813.

San Martín: Tarapoto, *Ule 6350*. Brazil; Paraguay.

Banisteria leiocarpa Juss. Arch. Mus. Paris 3: 395. 1843; 450.

Low shrub or scandent with lutescent sericeous branchlets, petioles, leaves (in age only beneath) and panicles, these composed of bracted umbels on peduncles about 2 cm. long; stipules interpetiolar, densely velutinous, biglandular, about 1 mm. long; petioles to nearly 2 cm. long, biglandular at apex; leaves broadly rhombi- or rotund-ovate, shortly acuminate at base, acutely so at tip, to 7 cm. long, 6 cm. wide, the middle and 7–10 parallel primary nerves prominent beneath, coriaceous-chartaceous, involute margins above the base usually with 2 glands; pedicels 1 cm. long or little longer, the lanceolate acute bracts and bractlets 1–2 mm. long; flowers about 13 mm. wide, yellow, the oval sepals eglandular, the glabrous petal limb orbicular-cochleate, fimbriate with recurved claw about 2 mm. long; stamens

glabrous, slender, twice as long as sepals, the finally resupinate oval anthers 1 mm. long; ovary densely hirsute; styles sigmoid, equal, densely long-setose with small capitellate stigmas; fruit unknown.—Var. *populifolia* Ndz. is the typical form described above, the axillary panicles with as many as seven umbels and attaining 1 dm.; var. *parvifolia* Ndz. is smaller in all parts, leaves ovate, apiculate about 4 cm. by 3.5 cm., primary nerves 4–6, panicles with to nine umbels but attaining only 5 cm. F.M. Neg. 24251.

Piura: Shores of the Río Huancabamba in rocks, *Weberbauer 6063* (var. *parvifolia*).—Cajamarca: Mouth of the Río Chinchipe, 800 meters, *Weberbauer 6230*.—Amazonas: Chachapoyas, *Mathews 2126*, type. Rock outcrops near Tupen, *Weberbauer 4794;* 155.—Huancavelica: Open savannah bush in the valley of the Río Mantaro below Colcabamba, *Weberbauer 6466* (var. *parvifolia*).—Cuzco: Sahuayaco, Prov. Convención, 850 meters, (*Vargas 2044*).

Banisteria leptocarpa Benth. Lond. Journ. Bot. 7: 130. 1848; 412. *B. elegans* Tr. & Pl. Ann. Sci. Nat. sér. 4. 18: 322. 1862, at least as to Peru.

Liana or spreading shrub with many divaricate leafless branches forming intricate masses; younger parts typically rusty sericeous, the indument more or less persisting on the finally terete branches, the leaves, at least in Peru, soon glabrous or essentially and rather more elliptic than ovate, coriaceous, reticulate especially beneath and minutely glandular toward or at the apiculate tip, the base broadly obtuse or rounded, often about a dm. long and nearly half as wide; petioles stout, 6–8(–14) mm. long; stipules axillary, acutely conical, 1 mm. long; panicles more or less ample with subfoliate ciliate- or stipitate-glandular bracts, often biglandular at base and 4–6-flowered umbels of medium yellow flowers (about 16 mm. wide), their slender sometimes 1 cm. long pedicels minutely bracteolate at base; sepals eglandular in type, rounded ovate, 3–5 mm. long; petals fimbriate, 6–8 mm. broad with claw 1–3 mm. long; samara pubescent, the ovoid nut barely 4 mm. high with a minute dorsal tooth, the wing to 2.5 cm. long, 1 cm. wide.—Woytkowski got his number *19* from plants completely covering a plain cleared for about ten years; thus without support the 8 cm. thick trunks were branching horizontally at around 8 dm., repeatedly, and, spreading in all directions, formed a maze of leafless stems bearing few inflorescences of gay but light yellow flowers on upright twigs with deep green glossy leaves. The species in Peru is scarcely typical but it seems probably a variant

only of the type from Guiana; at any rate it accords better with this species than with *B. elegans*, with apparently always much larger flowers; cf. Sandwith, Journ. Arnold Arb. 24: 222. 1943. However, the species could not be distinct on the basis of presence or absence of two leaf glands, marginal glands or calyx glands as Niedenzu, 390, indicated, variable characters. F.M. Negs. 24252; 24250 (*B. elegans*, var.); 12809 (*B. elegans*, var.).

San Martín: Zepelacio, *Klug 3329* (det. Standley, *B. elegans*). Rioja, 900 meters, *Woytkowski 19* (det. Standley, *B. elegans*).—Loreto: Mishuyacu, *Klug 1175; 136* (flowers white); *Killip & Smith 29922; Klug 167* (this det. Morton). Timbuchi, *Williams 971*. Río Mazán, *José Schunke 63* (det. Standley, *B. elegans*). Mouth of the Santiago, (*Tessmann 4184*, det. Ndz.). Guianas. "Nucuna wasca" (Williams).

Banisteria longialata Ndz. Ind. Lect. Lyc. Brunsb. 19. 1901; 445.

Upper branches somewhat compressed or angled and canaliculate, smooth but early with a minute and obscure indument, to 7 mm. thick; stipules 1 mm. long; petioles 1.5 to about 2 cm. long; leaves of the branches to more than 2 dm. long, 9 cm. wide with acumen 2 cm. long, those of the flowering stems 1– scarcely 7 cm. long, 3.5–25 mm. wide, all chartaceous, soon glabrous or glabrate above as beneath or, according to Niedenzu, thinly but persistently subsericeous with rusty minute trichomes, the 6–10 primary nerves rather prominent both sides, the margins nearly plane; racemes 4–12-flowered, rusty or golden sericeous, simple or rarely branched, 1–2.5 cm. long, the bracts at base broadly subamplexicaul, the lowest 2.5–4 mm. long, the upper half as long, the rounded bractlets hardly 1 mm. long, pedicels about twice as long; sepals glandular; flowers unknown except styles, these barbate at base; obovate samara wing 5–6 cm. long, above the base 1.25, below apex 2.25 cm. wide, the nut laterally compressed and at base enclosed by lower margin of the wing with orbicular appendage at upper tip 12 mm. long, half as high and with two winglets on both sides about 16 mm. long, 6 mm. high.—The pubescence described by the monographer is not apparent on the specimen seen. *B. Rusbyana* Ndz., 445, the type from Bolivia, is glabrate, the anterior style barbate above the middle; these two forms or entities may be the "oco yagé" or "chagro panga"; cf. Morton, Journ. Wash. Acad. Sci. 21: 487. 1931. F.M. Neg. 12816.

Huánuco: Pozuzo, *Ruiz & Pavón*, type.

Banisteria lucida Richard, Act. Soc. Hist. Nat. Paris 1: 109. 1792; 441. *Banisteriopsis lucida* (Richard) Small, N. Amer. Flora 25: 133. 1910.

Erect or scandent, the young canaliculate compressed branchlets minutely ashy pilose, the branches terete, smooth or nearly, glabrous, to 4 or 5 mm. thick; stipules deciduous, lineately confluent, the scar minute; petioles more or less pilose, eglandular, 4–8 mm. long; leaves elliptic-obovate to lanceolate-oblong, acute at base, with acumen to 2 cm. long, coriaceous, 5–16 cm. long, 2–5.5 cm. wide, glabrous and lucid above, opaque and minutely or sparsely sericeous beneath, the eglandular margins nearly plane to revolute; umbels rusty sericeous, 3–5 in corymbs, peduncles 5–15 mm. long, pedicels 15–24 mm. long, bracts and bractlets broadly ovate, connate, 1–1.5 mm. long; flowers 17–22 mm. broad, yellow, the rotund sepals glandular, the petals sericeous, fifth glandular-fimbriate, the articulated claw 3–4 mm. long, the reflexed claws of the others scarcely 2 mm. long; stamens and especially styles far exserted above the sepals, the anthers pilose, the posterior styles basally, the anterior to above the middle, bearded; ovary hirsute; samara nut with 6–12 nerves radiately spreading into lacerate lobules, more or less imbricate, the ventral areole oblong, nearly 1 mm. long, the wing only 4–8 mm. wide at base, 4–5.25 cm. long, the basal knob triangular or rounded.—Cf. the supposedly related *B. peruviana*, *B. nutans*, *B. caduciflora*, especially since *B. lucida* according to Kostermans is only in tropical Brazil, Guiana, and the West Indies. The Raimondi specimen ought, from locality, to be *B. caduciflora*. Illustrated, Pflanzenreich, l.c. pages 14 and 444 (samara). F.M. Neg. 24253.

Junín: Tarma, (*Raimondi*, det. Ndz.). Brazil to Trinidad.

Banisteria muricata Cav. Diss. 9: 423. *pl. 246*. 1790; 438. *B. argentea* (HBK.) Spreng. Syst. 2: 388. 1825. *Heteropteris argentea* HBK. Nov. Gen. & Sp. 5: 164. *pl. 450*. 1822, at least as to Peru. *Banisteriopsis argentea* (HBK.) C. B. Robins. N. Amer. Fl. 25: 133. 1910. *B. metallicolor* Juss. in St. Hil. Fl. Bras. 3: 46. 1832, as to Peru. *Banisteriopsis metallicolor* (Juss.) O'Donell & Lourteig, Lilloa 9: 259. 1943. *B. acanthocarpa* Juss. Ann. Sci. Nat. sér. 2. 13: 281. 1840. *B. Benthamiana* Juss. l.c. *B. atrosanguinea* Juss. l.c. *B. (atro) sanguinea* Juss. var. *Benthamiana* (Juss.) Macbr. Field Mus. Bot. 8: 120. 1930.

Liana or perhaps early erect and the branches clambering, these becoming glabrous and more or less lenticellate and verruculose, the

branchlets as the leaves more or less appressed sericeous or minutely puberulent-tomentose; petioles usually 1–2 cm. long, often with 2–4 glands medially or at the apex; stipules minute; leaves typically broadly ovate, mostly obtuse at base, acuminate or at least apiculate, frequently 10–15 cm. long, about half as wide, in age glabrate above, typically closely covered with a silvery indument beneath with often 1–several glands, the 5–7 primary nerves prominent; panicles more or less compound; pedicels 5–10 mm. long or longer, the ovate bracts or bractlets 1–1.5 mm. long; calyx in type 8-glandular, the sepals ovate, acute; petals roseate, fimbriate, about 6 mm. long, the fifth one smaller and glandular, all clawed; stamens and styles unequal, glabrous; samara nut typically with 2 mucros and at least one dorsal crest but variously spinescent-muricate or rugose-aculeate, the oblong-obovate wing to 4 cm. long, 1.5 cm. wide.—Variable and possibly divisible into one or more entities but not at all clearly from present collections; best marked probably is var. **atrosanguinea** (Juss.) Macbr., comb. nov. (*B. atrosanguinea* Juss. Ann. Sci. Nat. sér. 2. 13: 281. 1840), the pubescence, especially in the inflorescence, a short, dense, somewhat spreading puberulence; *B. argentea* (HBK.) Spreng. var. *transiens* Ndz. is properly a part of *B. muricata*, the HBK. plant probably separable conveniently at least by its yellow flowers; *B. metallicolor* seems less distinct, especially its variants *subrotunda* Ndz. and *aurea* Ndz., which point out a leaf-form and a color form in pubescence, the type being more or less metallic-silvery, but there are specimens (*Mexia*) that have leaves merely sparsely sericeous even beneath. Illustrated, Juss. Arch. Mus. Paris 3: *pl. 13* (fruits). F.M. Negs. 37469; 12801; 24248 (*B. Benthamiana*); 19357; 12803 (both *B. atrosanguinea*); 19362 (var.); 12800 (*B. acanthocarpa*).

According to Herrera this species is toxic, as indicated by the native name, while Mexia observed the old-rose tinted fruits helping to color the landscape, and Woytkowski the fragrant pink flowers in rich clusters all over the supporting laurel trees.

Cajamarca: Valle de Tabaconas, *Weberbauer 6160* (det. Ndz. *B. argentea*).—San Martín: San Roque, *Williams 7401* (var.). Zepelacio, *Klug 3573; 3506* (both the var.). Juanjuí, *Klug 4373* (det. Standley, *B. argentea*). Tarapoto, *Spruce 4530* (det. Ndz. *B. metallicolor*).—Junín: La Merced, *Killip & Smith 23378; 23757*. Colonia Perené, *Killip & Smith 25011; 25069*.—Huánuco: Mission Uchiza, *Poeppig* (det. Ndz. *B. argentea*). Tocache, *Poeppig 1879*. Chinchao, *Ruiz & Pavón; Dombey* (type, *B. acanthocarpa, B. fulgens*

Ruiz mss.). Cuchero, *Poeppig 1214* (*B. acanthocarpa*); *Poeppig 99* and *1752* (type, *B. atrosanguinea*). Shapajilla, *Woytkowski 34* (det. Standley, *B. argentea*).—Loreto: Yurimaguas, *Poeppig 2433; Spruce 3885.* Balsapuerto, *Klug 3032.* San Antonio de Cumbaso, *Ule 6862* (det. Ndz. *B. metallicolor*).—Cuzco: Valle de Lares, 2,000 meters, *Herrera 672; Weberbauer 7935.* Río Vilcanota, *Mexia 8027; 8029* (det. Morton, *B. argentea*).—Río Acre: Seringal Auristella, *Ule 9480* (det. Ndz. *B. argentea*). Without locality, *Jos. de Jussieu,* type; (*Mathews 2024,* type, *B. Benthamiana*). Bolivia. "Sarcello" (Mexia); "aya-huasca" (Herrera).

Banisteria nigrescens Juss. in St. Hil. Fl. Bras. 3: 44. 1832; 439.

Erect or scandent, the branchlets compressed, the younger sericeous, soon glabrate, the terete branches minutely tuberculate-lenticellate, to 4 mm. thick; stipules minute, caducous; petioles subglabrous, 5–15 mm. long; leaves oblong, subacute at base, long-acuminate, 2–13 cm. long, 1–5(6) cm. wide, glabrous, lustrous and smooth (nerves impressed) above, puberulent beneath, the primary nerves prominently reticulate and the crenulate-repand revolute margins with many small subimpressed or sessile glands; umbels foliate, sometimes reduced, the peduncles sometimes bracted medially, the pedicels 12–18 mm. long, the lanceolate bracts and bractlets 1–2 mm. long; flowers yellow (drying dark), about 2 cm. broad, the sepals glandular, the petal limb obovate-orbicular glandular-fimbriate; stamens glabrous, the filaments stout, subequal as the straight or nearly straight glabrous styles; samara unknown.—Cf. *B. peruviana* to which if distinct the Tessmann collection (not seen) may be referable. F.M. Neg. 19363.

Loreto: Rain-forest, mouth of the Río Pastazza, (*Tessmann 4945*). Brazil; Bolivia.

Banisteria nutans Ndz. Ind. Lect. Lyc. Brunsb. 15. 1901; 440.

Allied by the author to *B. peruviana* but like it imperfectly known and, ex char. with few contrasting characters: branches smooth, blackish; stipules dentiform, lineately confluent at base; petioles puberulent, 4–6 mm. long; leaves oblong-lanceolate with acumen to 2 cm. long, glabrous, nearly smooth and somewhat lustrous above, minutely and sparsely puberulent beneath, 6–14 cm. long, 2.5–5 cm. wide, the 6–11 primary nerves prominently reticulate both sides, margins scarcely revolute; umbels golden sericeous, the peduncles divided into 2–3 internodes 1–1.5 cm. long, pedicels nodding, 1.5 cm.

long; flowers 17.5 mm. broad, the apical glands thick; petals yellow sericeous without, the limb 6–10 mm. wide, claw 2–3 mm. long; anthers glabrous.—Fruit unknown in type but placed by author in group with curved stamens and unequal arcuate styles; however if the Raimondi collection belongs to the species it seems to be the same as *B. peruviana*, as in this case the fruit is similar, except (ex photo) smaller and less deeply rugose. The Cook and Gilbert specimen has fruits with wings 3.5 cm. long, 1.5 cm. wide, with basal lobe about 4 mm. high, the nut only 5 mm. wide and long, cristate and rugose. F.M. Neg. 12820 (*Raimondi*).

Cajamarca: Tambillo, (*Raimondi 3518*, det. Ndz.).—Huánuco: Cuchero, (*Poeppig 1497*, type).—San Martín: San Roque, *Williams 7274; 7776* (maybe, or *B. caduciflora* but anthers glabrate; distributed as *B. nigrescens*).—Cuzco: Small tree, San Miguel, Urubamba Valley, *Cook & Gilbert 982*.

Banisteria oxyclada Juss. Ann. Sci. Nat. sér. 2. 13: 282. 1840; 430.

Liana, marked by the overall more or less sericeous lanuginose ashy or sulphureous tomentum, deciduous only from the terete older branches; stipules mucroniform, connate into an annulus, the stout petioles to 2.5 cm. long, often biglandular above; leaves ovate to subrotund, obtuse to subcordate and often oblique at base, rounded or obtusely acuminate but usually apiculate at apex, to 17 cm. long, 15 cm. wide, chartaceous, nearly smooth and opaquely velutinous above, sericeous-lanuginose beneath, the 6–8 primary nerves prominent, the secondary parallel, areolate and sometimes with 1 or 2 minute glands; umbels 4-flowered, the peduncles 5–15 mm. long in leafy panicles (leaflets to 2 cm. long, biglandular), flowering peduncles obsolete to 3 mm. long, pedicels less than 1.5 mm. long, bracts and bractlets ovate-lanceolate, 2–4 and 1–3 mm. long; flowers lilac, roseate or white, 2–2.5 cm. broad, the ovate sepals linear-glandular, the fimbriate obovate petal limb 8–11 mm. long, short-clawed, the fifth one long-clawed, glandular to base; stamens and styles very diverse; anthers glabrous, the 5 posterior small, connective not enlarged but appendaged, filaments very unequal, 2 styles S-curved, anterior nearly straight; samara nut smooth to aculeate, wing typically oblong-obovate, 2.5–4 cm. long, 1.5 cm. wide, sometimes smaller.—The type, as usual not indicated by Niedenzu, is by d'Orbigny from Chiquitos, Bolivia, and the species occurrence in Peru is doubtful. F.M. Neg. 12822.

Huánuco(?): *Haenke*, without data. Bolivia; Brazil; Paraguay.

Banisteria padifolia [Poeppig] Ndz. Ind. Lect. Lyc. Brunsb. 8. 1900; 408.

Rather slender liana, the younger parts yellowish sericeous, the branchlets compressed, the terete glabrate branches brown-violet, 1–4 mm. thick; stipules not observed; petioles tomentulose, 5–7 mm. long; leaves lanceolate and long acuminate, obtuse or rounded at base, to 10 cm. long, 4 cm. wide, except for the midnerve beneath smooth and soon glabrous or glabrate both sides, the about 6 lateral nerves and the approximate secondary ones parallel, membranous, deciduous, the plane margins mostly with many impressed glands; floral leaves similar but smaller and many-glandular; racemules 4–6-flowered, 2–3 cm. long on peduncles 5–25 mm. long, disposed in leafy branchlets or panicles; pedicels 7–9 mm. long; bracts and bractlets ovate-lanceolate, to 2 mm. long; flowers 15–16 mm. broad, yellowish, the subglabrous rotund-ovate sepals glandular, the concave petal limb long-glandular-ciliate, the claw 2–2.5 mm. long; stamens unequal, the anther connective of 3 pilose, thickened; posterior styles S-curved, the anterior nearly straight, all with orbicular-capitellate stigmas; samara immature but the wing unappendaged at base.—F.M. Neg. 32412.

Huánuco: In sunny shrubs near Cuchero, *Poeppig 1288*, type.

Banisteria peruviana Ndz. Ind. Lect. Lyc. Brunsb. 15. 1901; 440.

Branchlets compressed, canaliculate, soon glabrate, the terete brown or reddish branches lenticellate and tuberculate, to 4 mm. thick; stipules minute, connate at base into a linear annulus; petioles 5–10 mm. long; leaves elliptic, acute or obtuse at the sometimes slightly attenuate base, apical acumen to 1.5 cm. long, glabrate or paler and with a few trichomes persisting beneath, 8–14 cm. long, 4–7.5 cm. wide, midnerve very thick, the 6–8 primary nerves prominent both sides, arcuately confluent below the revolute margins; umbels solitary or binate at the axils, the peduncles bibracteate below the middle, 1.5–2 cm. long, fruiting pedicels 2–3 cm. long, bracts and bractlets broadly rounded, 1–1.5 mm. long; flowers not fully known; sepals glandular and reflexed; anthers puberulent; samara nut spheroid to 2 cm. wide, the lateral nerves lamellately dilated, the wing to 5 cm. long, 17 mm. wide, the upper margin little curved with rounded extension 12 mm. high and long.—F.M. Neg. 12824.

Cajamarca: Tambillo, *Jelski*, type.—Loreto: Open area near Pucalpa on the middle Ucayali, (*Tessmann 3106*).

Banisteria platyptera Griseb. Linnaea 22: 17. 1849; 447.

Similar to the allied *B. pubipetala* but the leaves plane and eglandular, the bracts and bractlets rotund; anther cells puberulent both ends; dorsal samara wing to 6.5 cm. long, 2.75 cm. wide; branches black and smooth; leaves 5–12 cm. (–3 dm.) long, 2.5–6 (–13) cm. wide, coriaceous, smooth above; flowers umbellate, more than 2 cm. wide, the pedicels 2–3.25 cm. long; filaments and styles rather stout, subequal; samara glabrous, the winglets entire.—The Peruvian plant has larger leaves as noted, forma *grandifolia* Ndz. This species probably should be included in *B. pubipetala*, at least as to Peru. F.M. Neg. 12825.

San Martín: San Antonio de Cumbaso, (*Ule 6705*). Brazil; Colombia; Venezuela.

Banisteria pubipetala Juss. in St. Hil. Fl. Bras. 3: 41. *pl. 169.* 1832; 446.

Low liana or weak-stemmed tree or shrub, the compressed canaliculate branchlets and terete branches soon glabrate, 2–5 mm. thick, grayish or reddish, often lenticellate; stipules dentiform, minute or caducous; petioles 4–8 mm. long; leaves acute or attenuate at base, typically obovate or ovate-elliptic or in var. oblong-lanceolate, long- to caudate-acuminate, to 15 cm. long, 4–7.5 cm. wide, chartaceous, glabrous both sides and rather prominently nerved and reticulate, the often sinuate margins revolute and minutely glandular; flowers yellow, 1.5–2 cm. wide, in 6–10-flowered corymbs with peduncles a few mm. to 1.5 cm. long or in 4-flowered umbels on peduncles 5–10 mm. long, articulate and bibracteate below the middle, 1, 2 or 3 in axils or several pseudo-terminal, the pedicels 1–2.5 cm. long, the ovate acute bracts and bractlets 1–1.75 mm. long; sepals round-oval, glandular; petals sericeous without, limb orbicular-cochleate, the claw 2 mm. long, 3–5 mm. for the fifth and articulate at apex; stamens and styles (these barbate) rather slender, two filaments much shorter than two styles; anthers glabrous; samara early densely pilose, the nut subglobose, the lateral winglets various, entire to dissected, the dorsal wing sometimes (in Peru) contracted at base and falciform, always sinuate and apically more or less hamate-arcuate, scarcely 2 cm. long and half as wide below the apex to twice as long and nearly 2 cm. wide.—The Peruvian plant is var. **constricta** (Griseb.) Macbr., comb. nov.—*B. constricta* Griseb. in Mart. Fl. Bras. 12, pt. 1: 46. 1858—leaves oblong-lanceo-

late, flowers mostly in corymbs, about 15 mm. wide, bracts and bractlets 1.25–1.75 mm. long. F.M. Negs. 24255 (var.); 35655.

Junín: Chanchamayo, *Raimondi* (det. Niedenzu).—San Martín: Tarapoto, *Spruce 4272; Ule 6439; Williams 5426; 6157.* Brazil; Bolivia; Paraguay.

Banisteria quitensis Ndz. Ind. Lect. Lyc. Brunsb. 10. 1900; 427. *Banisteriopsis quitensis* (Ndz.) Morton, Journ. Wash. Acad. Sci. 21: 486. 1931.

Liana, the newer parts sparsely appressed sericeous, the soon glabrate branchlets compressed, striate, the new shoots terete, smooth, to 2.5 mm. thick; stipules minute; petioles 1–2 cm. long, broadly grooved above, glabrate, rarely with 1 gland; leaves ovate or lanceolate-ovate, obtuse or very shortly contracted at base, acuminate (acumen 1–3 cm. long), little revolute, chartaceous, 5–15 cm. long, 2–8 cm. wide, glabrate, but the 5–7 prominent nerves fulvus-golden, especially beneath, the secondary subparallel, subareolate, eglandular or with a few minute glands beneath; floral leaves lanceolate, acute, to 3 cm. long with petioles to 5 mm. long, gradually reduced above to lanceolate bracts 3 mm. long; umbels 4-flowered in twice compound sparsely ashy sericeous panicles to nearly 3 dm. long, the umbel peduncles 3–10 mm. long, the pedicels slender, about 1 cm. long, the lanceolate bracts and bractlets 2–3 mm. long; perfect flower unknown; sepals lanceolate, sericeous without, glandular or eglandular; petals yellow, glabrous; stamens and styles glabrous, the former unequal, the latter subequal, slender, more or less curved; samara nut densely sericeous, 5 mm. broad, sometimes with a tubercle at base as also on lateral nerves, the dorsal wing to 2.5 cm. long, 11 mm. wide, nearly oblong or somewhat obovate.—Plant noteworthy with *B. caapi* Spruce as the source of an alkaloid which native peoples used as an excitant at festivals; compare the Spruce species. I have not seen the Williams collection. Illustrated, Pflanzenreich, l.c. page 403 (fig. 32-E, not 31-E, error, l.c. page 428). F.M. Neg. 12792.

Loreto: Lower Itaya, (*Williams 33a*, according to the collector). Flood-free wood at Soledad, (*Tessmann 5325*). San Isidro at mouth of the Patazza, (*Tessmann 4974*). Ecuador. "Ayawasca" or "hayawasca" (Tessmann); "vejuco bravo" (Eggers); "bejuco bravo."

7. STIGMAPHYLLON Juss.

More or less woody and usually scandent plants with the samara of *Banisteria* (in two species the wing greatly reduced) but usually

with only 6 fertile stamens (those opposite the yellow petals). Calyx with 4 sepals biglandular. Petals dentate or fimbriate, at least the limb, 4 more or less concave. Styles somewhat unequal, all usually more or less dilated, even foliately, sometimes scarcely or not at all, sometimes only in part. Stipules none or minute. Leaves entire to more or less divided, often remote, and usually with a pair of large glands on the petioles, rarely on the midnerve beneath. Flowers often in dichotomously disposed umbels, the peduncles usually longer than the pedicels.—According to Haumann Merck, Rec. Inst. Bot. Bruxelles 9: 21. 1913, all stamens are fertile in *S. littorale* Juss., 511 (which species is nearly *S. tomentosum*); Merck's discovery caused Kostermans to suggest, Pulle, Fl. Surinam. 2, pt. 1: 203. 1936, that this may be found true for other species when observed living; according to Standley and Steyermark, Fieldiana; Bot. 24, pt. 5: 493. 1946, only 4 stamens are fertile, presumably the Guatemalan species. The name, originally "*Stigmaphyllon*," refers, of course, to the often foliose style tips and was "corrected" by Niedenzu to *Stigmatophyllon* and later to *Stigmatophyllum*.

Development of marginal glands and presence of pubescence on anthers may not be constant characters, either here or in other groups. In the entire family there is probably hybridization followed by apomixis.

The position of *S. Kuhlmannii* in key ex char. may not be correct.

Styles not foliose, minutely if at all dilated, dissimilar or truncate or rounded apically, usually one (the anterior) truncate, uncinately produced; leaves cordate-rotund-elliptic, typically soft pubescent beneath; samaras (known) aceriform.

Leaves broadly cordate, acute or apiculate, chartaceous; styles subequal.....*S. primaevum, S. bogotense.*

Leaves elliptic, obtuse or rounded, rigid-coriaceous; styles unequal, two beaked, one attenuate or acute.....*S. peruvianum.*

Styles usually subsimilar, two or often all more or less foliose-dilated; leaves sometimes loosely tomentose beneath.

Mature leaves silvery beneath with a dense appressed indument, some trichomes long; marginal glands obscure or obsolete; flowering branches simple to trifurcate, the umbels congested. *S. fulgens.*

Mature leaves glabrous to loosely tomentose, not pubescent as above.

Pubescence of leaves beneath tomentose or loose, sometimes sparse but trichomes not appressed, always long, often tangled.

Samara trapezoid, the wing and nutlet subequal; leaves membranous; flowers 2–3, to 3 cm. wide, anthers glabrous. *S. megacarpon.*

Samara aceriform, the wing much longer than nut.

Flowers 16–18 mm. wide; styles and stamens unequal; anthers puberulent; leaves membranous. *S. tiliaefolium.*

Flowers 2–3 cm. wide; styles subequal; anthers glabrous or ciliate; leaves subcoriaceous.....*S. Gayanum.*

Pubescence lacking or if present on leaves beneath a fine appressed nearly puberulent or sericeous strigosity unless for a few long trichomes on midnerve.

Leaves glabrous or essentially, any trichomes present, long.

Leaves subrotund-cordate, often little longer than wide.

Anthers glabrous; samara nut alulate-crested. *S. convolvulifolium.*

Anthers ciliolate; samara nut rugose...*S. cardiophyllum.*

Leaves oblong-elliptic, often about twice as long as wide. *S. ellipticum.*

Leaves finely pubescent beneath.

Styles very unequal, 1 long-beaked; samara wing to 4 or 5.5 cm. long, the nut crested.....*S. brachiatum.*

Styles subequally foliose; samara wing shorter, the nut rugose to crested.

Leaves ovate-lanceolate, long-acuminate....*S. puberum.*

Leaves subrotund-cordate, often little longer than wide. *S. Kuhlmannii, S. strigosum.*

Stigmaphyllon bogotense [Bonpland] Tr. & Pl. Ann. Sci. Nat. sér. 4. 18: 320. 1862; 480. *S. Ruizianum* Ndz. Ind. Lect. Lyc. Brunsb. 10. 1899, fide the author.

Stems twining, early tomentose finally glabrate, the internodes to 2.5 dm. long; petioles to 4 cm. long with 2 apical sessile glands; mature or larger leaves ovate, unequally cordate at base, acute or obtusish apiculate, to 11 cm. long, 8 cm. wide, chartaceous, in age glabrate above, typically persistently rusty or ashy lanuginose be-

neath (except in var. *subglabratum*), entire but glandular-repand, pinnately parallel-nerved, areolate; floral leaves rotund, the subracemose corymbs on peduncles 2–10 mm. long, the flowering peduncles and pedicels 5–15 mm. long, linear-lanceolate bracts and bractlets 1.5–3 mm. long; flowers canary yellow, 15–20 mm. broad, the ovate sepals with oval glands, claw of the larger petals strongly reflexed, 2.5–3.5 mm. long; styles subequal, laterally compressed, not foliose; samara old rose color, pubescent, the nervose wing 2–5 cm. long, 12–20 mm. wide, the nut longitudinally or more or less transversely costate, cristate or somewhat alulate.—Styles nearly truncate. Simulates *S. alternans* Tr. & Pl. 501 of Colombia, with distinctly foliate styles, to which species my *1752* and *Raimondi* from Cuzco were referred by Niedenzu, but both these specimens have the styles of *S. bogotense*. The Raimondi sheet from Amazonas was named forma *renifolium* Ndz. Repert. Sp. Nov. 26: 346. 1929. *Killip & Smith 28054* is not typical but is without fruit. Liana used for lashings (Mexia). F.M. Neg. 24238.

Cajamarca: River shrubs near Huambos, 2,200 meters, *Weberbauer 4207*.—Junín: Vitoc, *Ruiz & Pavón*. Near Palca, 1,700 meters, in rocks by brook, *Weberbauer 1793;* 247.—Huánuco: Pozuzo, *Ruiz & Pavón*. Piedras Grandes, *Woytkowski 154*. Woods between the Río Monzón and the Río Huallaga, 600 meters, *Weberbauer 3591*. Churubamba, *Mexia 8123; 8127* (det. Morton). Mirador to Chinchao, *Mexia 04143* (det. Johnston).—Amazonas: Chachapoyas, Valle de Huayabamba, *Raimondi* (form).—Loreto: Yurimaguas, *Killip & Smith 28054* (sp. nov. in herb., Morton). Bolivia to Colombia and Venezuela. "Morcilla huano."

Stigmaphyllon brachiatum Tr. & Pl. Ann. Sci. Nat. sér. 4. 18: 316. 1862; 484.

Complanate branchlets and peduncles more or less rusty tomentulose; petioles 1–6 cm. long, biglandular a little below or at the apex; leaves orbicular or ovate-reniform, mostly rounded to the cuspidate tip, to 11 cm. long and nearly as wide, margins minutely glandular, glabrate above at maturity, densely silvery sericeous beneath or in Peru inconspicuously, nerves, especially the primary, prominent beneath, the basal ones pediform, the others pinnate, the secondary parallel among themselves; inflorescences axillary, with barely 5 mm. long biglandular bracts, the articulate pedicels 5–15 mm. long; flowers 14–16 mm. wide; sepals ovate or suborbicular; petals with short claw; filaments slightly unequal in thickness,

styles in length, the appendage of the anterior falcate-recurved, very narrow; samara nut rugose to cristate and more or less appendaged, the wing at base 6–9 mm. broad but to 18 mm. wide above and to 5.5 cm. long.—The Peruvian plants are not quite typical but appear to have the distinctive styles. Illustrated, Pflanzenreich, l.c. page 467 (leaf, styles). F.M. Neg. 24238.

Loreto: Mishuyacu near Iquitos, *Klug 319; 113* (det. Morton). Santa Ana, Upper Río Nanay, *Williams 1225.* Venezuela and Colombia. "Curi-sisa" (Williams).

Stigmaphyllon cardiophyllum Juss. Ann. Sci. Nat. sér. 2. 13: 289. 1840; 494.

Branches smooth, dark red, glabrate; stipules small, acute; petioles 2.5–4 cm. long, puberulent, biglandular at apex; leaves cordiform, acuminate, glabrous both sides, paler beneath, membranous, the reddish nerves scarcely prominently reticulate, the subpinnate secondary sometimes terminating marginally in a cilium but entire and eglandular; flowering branches axillary, puberulent, dichotomous above and with smaller lanceolate leaves at the angles; peduncles 12 mm. long, the pedicels a little longer; calyx segments ovate; petals 13 mm. long; anther cells a little villous, styles apically foliaceous; samara nearly glabrous, the nut laterally rugose but ecristate, the wing 2.5 cm. long, broadly and shortly appendaged at base.—*Williams 6883* distributed as this species is incomplete and probably is referable to *S. tiliaefolium* or allied form. F.M. Neg. 35638.

Peru (possibly). Northern Brazil.

Stigmaphyllon convolvulifolium (Cav.) Juss. Ann. Sci. Nat. sér. 2. 13: 289. 1840; 489. *Banisteria convolvulifolia* Cav. Diss. 9: 428. *pl. 256.* 1790. *Banisteria dichotoma* L. Sp. Pl. 427. 1753(?). *S. dichotomum* (L.) Griseb. Linnaea 13: 207. 1839(?).

Scandent shrub 2–9 meters high, the newer compressed branchlets velutinous, the terete branches striate to 4 mm. thick; stipules caducous, broadly rounded to 0.5 mm. long; petioles 3–6 cm. long, conspicuously biglandular at tip; leaves cordate, more or less long-acuminate, to 15 cm. long and 11 cm. wide, the more or less repand margins with sessile or ciliiform glands, membranous, early subsericeous, in age glabrate, except along the little prominent nerves; corymbs 10–20-flowered, dichotomously terminating axillary branches, the compressed peduncles 4–10 mm. long, pedicels 3–7(–15)

mm. long, bracts glandular and bractlets 1–1.5 mm. long; flowers 2–3 cm. broad; sepals rounded ovate; petals yellow without, marginally dotted, the ciliate or fimbriate orbicular limb with claw 2–3(–4) mm. long; anthers glabrous (or, as here interpreted, a little pilose), the connectives, especially the sterile, very thick; styles subhispid at base, the tips usually foliolate, that of the anterior spreading, those of the posterior pendulous and ordinarily minutely apiculate beneath; samara glabrate, the suberect wing to 2.5(–5) cm. long, nearly 12 mm. wide, the straight anterior edge dilated-appendaged at base, the nut laterally crested transversely, the ventral areole obovate.—According to the monographer, l.c. 456, the Linnaean plant is either this species or *S. Lalandianum* Juss., 486, Brazil and Colombia, the leaves somewhat sericeous beneath, eglandular; there are several more closely allied species to be expected. But this and *S. tiliaefolium* may be variable and thus include more forms. I have seen no typical specimen from Peru. Illustrated, Pflanzenreich, l.c. page 487 (styles).

Loreto: Edge of overflowed woods at Yarina Cocha, (*Tessmann 3412*). Flood-free woods at mouth of the Santiago, (*Tessmann 3966*). Brazil to Martinique.

Stigmaphyllon ellipticum (HBK.) Juss. Ann. Sci. Nat. sér. 2. 13: 290. 1840; 499. *Banisteria elliptica* HBK. Nov. Gen. & Sp. 5: 161. 1822.

Slender stems glabrous, smooth, reddish or brownish, the young branchlets and peduncles sparsely sericeous; petioles to 1.5 cm. long, the two glands at or near the apex patelliform, sessile; leaves entire pinnate-nerved, the nerves and veins approximate and prominently reticulate especially above, rounded (to acutish or subcordate) beneath, mucronate, broadly ovate, often to 10 cm. long, 7 cm. wide but also longer or narrower, chartaceous, soon glabrous; umbels 2–5-flowered, sessile or shortly peduncled, the flowering peduncles 1–2.5 cm. long, pedicels gradually enlarged, 3–12 mm. long, ovate bracts and bractlets 1–2 mm. long; flowers yellow, nearly 3 cm. broad, sepals ovate, petals with fimbriate suborbicular limb, the claw 2–3 mm. long; style appendages nearly plane, the posterior acute; samara wing coriaceous, broadest above the base, oblong, acutely narrowed, 2.5 cm. long, 7 mm. wide with short protuberance on upper margin at base, the prominent nerves foveolate.—Type from Loja, Ecuador; cf. *S. peruvianum; S. echitoides* Tr. & Pl. 501, rather similar, of Colombia, has leaves tomentose beneath. F.M. Neg. 37484.

Cajamarca: In hedgerows at Izco, Prov. Cutervo, 1,300 meters, *Stork & Horton 10209* (det. Standley, *S. peruviana*). Brazil (Bahia) to Ecuador and Mexico.

Stigmaphyllon fulgens (Lam.) Juss. Ann. Sci. Nat. sér. 2. 13: 289. 1840; 492. *Banisteria fulgens* Lam. Encycl. 1: 368. 1783.

Conspicuously sericeous liana, the younger parts including the compressed branchlets more or less tomentose, only the leaves finally glabrate above but persistently silvery or bronze beneath, with a close lustrous indument; stipules minute but very broad, interpetiolar; petioles stout, to 7 cm. long, and with two large apical glands; leaves membranous or chartaceous, orbicular-ovate, to 17 cm. long and wide, reniform or somewhat cordate at base, the rounded top shortly acuminate or apiculate; peduncles to 18 cm. long with two orbicular conspicuously biglandular bracts 1–2 mm. long; pedicels enlarged apically, 7–12 mm. long, articulate, minutely bracteolate medially and basally; flowers yellow, 15–17 mm. wide, the ovate acute sepals with eight glands, the obovate-orbicular petals denticulate, the fifth 2–3 mm. long, the rest 6–7 mm. wide; stamens unequal, filaments and anthers glabrous; leaflet of straight anterior style emarginate (or plicate?), the sigmoid posterior ones with more pendulous leaflets; samaras two, sometimes red, puberulous, nut semiglobose with a lacerate crest each side, wing to 4.5 cm. long, upper margin with 1–3 mm. high appendage at base.—In part after Kostermans, who probably had the characteristic state; the Peruvian plant, *S. maynense* Huber, Bol. Mus. Goeldi 4: 575. 1906, is doubtfully distinct, the author himself only noting: leaves ovate, sometimes suborbicular, anterior style appendage not at all emarginate, upper margin samara scarcely appendaged; besides, I may add, the leaves usually about 10 cm. long, 8 cm. wide, seem to be more openly cordate at base, in general, and so propose the designation *S. fulgens*, var. **maynense** (Huber) Macbr., comb. nov. Niedenzu, 517, however, remarked: "This species seems scarcely to differ from *S. puberum*." F.M. Neg. 12855 (*S. maynense*).

Huánuco: Tingo Maria, *Soukup 2211* (det. Idrobo). Pozuzo, *Ruiz & Pavón* (probably their "*auriculata*" ined. in their Journal).—San Martín: Juanjuí, *Klug 3918* (det. Morton).—Loreto: Balsapuerto, *Klug 2895* (det. Standley). Pampa de Sacramento, edge of the quebrada Chingana, (*Huber*, type, *S. maynense*). To the Guianas and Colombia.

Stigmaphyllon Gayanum Juss. in St. Hil. Fl. Bras. 3: 56. 1832; 491.

Shrubby liana, the complanate branchlets, cylindric branches and leaves beneath densely clothed with a short, often reddish tomentosity; stipules minute, coriaceous, deciduous; petioles stout, biglandular at tip, to 6 cm. long; leaves nearly orbicular, or broadly ovate, rounded at base and apex or there emarginate or apiculate, sometimes 16 cm. long, 13 cm. wide; coriaceous or firm, typically punctate-scabrous above (apparently often smooth in Peru as elsewhere); inflorescence bracts linear, to 1 cm. long, biglandular; umbels many-flowered, peduncles 4–10 mm. long, pedicels 4–8 mm. long or longer, bracts and bractlets 1–1.5 mm. long; flowers around 2 or even 3 cm. wide; sepals broadly ovate; petals orbicular, cuneate to claw, dentate-fimbriate; anterior style appendage obcordate, emarginate, sometimes unequal; anthers glabrous, apically pilosulous or hirsute both ends (var. *prostratum* Ndz.); samara nut more or less crested, densely pubescent, the wing 3.5 cm. long or apparently even to 4.5 cm. long.—Description as usual after Niedenzu but thus interpreted it would be impossible to find it from his key since he lists it under the character "anthers glabrous"; all told, except for the larger flowers it is much like *S. tiliaefolium* and, except for the fruit, like *S. megacarpon*. Trailing for 10 meters, with showy deep yellow flowers (West). F.M. Neg. 35640.

Cuzco: In woods between Umasbamba and Chinche Road to Santa Ana, 1,600 meters, *Weberbauer 4989* (det. Ndz. *S. megacarpon*). In clearings below Machu Picchu, 2,100 meters, *West 6466* (det. Johnston, *S. megacarpon*). Brazil.

Stigmaphyllon Kuhlmannii Pilger, Repert. Sp. Nov. 42: 78. 1937.

Scandent, the branchlets sparsely or "scattered" hirsute or glabrate; petioles apically biglandular, slender, 3–6 cm. long; leaves rounded-cordate, a little narrowed to the shortly apiculate apex, those of the flowering branchlets 7–9 cm. long, membranous, glabrate above with short marginal glands, lightly "scattered" hirsute beneath, especially the nerves, these ascending from base, otherwise few, rather prominent beneath; panicles axillary, 2–3 times dichotomous, common peduncle 5–8 cm. long, primary corymb subsessile, umbelliform; flowers fallen; one style apically dilated, compressed, produced into a narrow blade, two with orbicular pendent blades 2 mm. long; samara glabrate; nut with little-developed crests but

with an elevated line, the wing 10–13 mm. long.—Placed by author with *S. lacunosum* Mart., 509, of Brazil with anthers hispid each end, two styles very thick, leaves silvery puberulent beneath; it seems more probable that it is allied to if not the same as one or another of the species common to the upper Amazon; nevertheless and curiously enough, since the type (from thick Igapó woods, Yanache, Solimões, *Kuhlmann 1550*) was incomplete, much Peruvian material has been so named.

Peru (see note above). Amazonian Brazil.

Stigmaphyllon megacarpon (Vell.) Griseb. in Linnaea 13: 209. 1839; 509. *Banisteria megacarpos* Vell. Fl. Flum. Icon. 4: *pl. 150*. 1827, Text 189 (ed. Netto 180). 1825. *S. tomentosum* Juss. in St. Hil. Fl. Bras. 3: 53. 1832.

A shrub or at least suffrutescent with virgate stems, the younger parts especially tomentose as well as the petioles and the leaves beneath, the former canaliculate above, 2–5 cm. long, the two sessile glands sometimes as much as 5 mm. below the apex; leaves often pseudoalternate, usually more or less cordate, acute to retuse but always mucronate, membranous, mostly 4–12 cm. long, 4–10 cm. wide, ordinarily entire and eglandulose; floral leaves ovate or bractiform; umbels sessile, 5–15-flowered, the floriferous peduncles 5–15 mm. long, pedicels half as long to as long, ovate obtuse bracts and bractlets 1–1.5 mm. long; flowers yellow, 2.5–3 cm. wide, the sepals suborbicular, the petals ciliate or fimbriate with claws 2–4 mm. long; anthers usually glabrous; anterior styles with cordate or semiorbicular appendages to 1.5 mm. long, 3 mm. wide; samara trapezoid, the nut longitudinally crested, the upper wing margin S-shaped.—The Vellozo plate shows clearly samaras with wing little if at all longer than body; cf. *S. Gayanum* for Peruvian specimens that have been referred here other than that by Ule, not seen. F.M. Neg. 35658 (*S. tomentosum*).

Río Acre: Seringal San Francisco, (*Ule 9485*). Brazil to Uruguay.

Stigmaphyllon peruvianum Ndz. Arb. Bot. Inst. Lyc. Brunsb. 8: 61. 1926; 485.

Liana, the newer shoots and the leaves especially beneath densely lanuginose; upper (first year) petioles scarcely 1 cm. long, becoming 17 mm. long; leaves cordate, obtuse or rounded at tip, those on younger shoots to 4.5 cm. long, the rest to 7 cm. long, 4 cm. wide, plane, rigid-coriaceous, only the midnerve prominent beneath and with two glands at its base; 4-flowered peduncles in 1 dm. long,

2–6-leaved branchlets, the peduncles 4–6 mm. long, pedicels 6–8 mm. long, ovate bracts and bractlets 1–1.5 mm. long; flowers yellow, more than 2.5 cm. broad, the erect ovate glandular sepals sericeous without, the spreading petals glabrous, the semiorbicular cordate-based limb fimbriate on slender claw 4 mm. long; posterior styles straight, longer and much thicker, anterior gradually attenuate, the former with somewhat beaklike tips; samara unknown.—Without fruit seems to be too near *S. ellipticum* and *S. echitoides* Tr. & Pl. 501, approaching the latter especially in styles.

Cajamarca: Mouth of the Chinchine, hills on the Marañón, *Weberbauer 6216*, type.

Stigmaphyllon primaevum Ndz. Repert. Sp. Nov. 26: 346. 1929.

Vigorous liana, the younger parts, petioles and mature leaves beneath tomentose or velvety tomentose; petioles 2.5–4 cm. long; leaves ovate-cordate, acute or obtuse or apiculate, to 15 cm. long, nearly 9 cm. wide, chartaceous, glabrate or nearly so above, pinnate-nerved beneath, the 5–6 primary nerves prominent both sides, biglandular at base; floral leaves 1–3 cm. long; umbels many-flowered, single to paniculate, the peduncle to 6 mm. long, pedicels 6–10 mm. long, bracts and bractlets 1–1.5 mm. long; flowers more than 2 cm. wide; sepals ovate, rounded apically with 8–10 oval glands; petals red, cordate, subentire, the fifth one fimbriate, 7 mm. long, claw 4–5 mm. long; stamens little diverse, styles subequal, apically complanate, rounded dorsally; samara sericeous, 3–5 cm. long, wing oblong-falciform, 3 cm. long, 1 cm. wide, scarcely with a tooth at base, the nut with 4 thick rugae both sides.—Unique in style character (Niedenzu) but not examined by me. F.M. Neg. 12787.

Cajamarca: Montaña de Nanchó, Prov. Hualgayoc, several collections by *Raimondi*, type (including numbers given at Dahlem, as *3177*, *5206* and others).

Stigmaphyllon puberum (Rich.) Juss. Ann. Sci. Nat. sér. 2. 13: 289. 1840; 504. *Banisteria pubera* Rich. Act. Soc. Hist. Nat. Paris 1: 109. 1792.

Scandent shrub, the compressed branchlets and peduncles golden or pale sericeous as the leaves beneath (or glabrate in age), the branches terete, glabrate, smooth, reddish; petioles sericeous, 1–4 cm. long; stipules broad, interpetiolar; leaves ovate or oblong-lanceolate, long-acuminate, obtuse or rounded at base, entire, membranous,

glabrate above, 6–16 cm. long, 2.5–7(–9) cm. wide, pinnate-nerved, the nerves prominent beneath; floral leaves reduced, often linear, biglandular; umbels 5–10-flowered, the common peduncles 1–7(20) cm. long, floriferous 1–3 cm. long, pedicels 3–8 mm. long, ovate bracts and bractlets scarcely 1 mm. long; flowers 16–20 mm. broad, the sepals ovate, the petals typically red without, yellow within, all but one concave, all fimbriate (the fifth orbicular one also glandular) and cuneate at base with claws 2–3(–4) mm. long; stamens thick, anthers glabrous with glandular-enlarged connectives, three posterior reduced; style leaves ample, cucullate, the anterior subcordate, the posterior falcate-acute; samaras (usually only two) typically smooth, triangular-pugiform, the wing to 3 cm. long, 12 mm. wide at base, narrowed to tip, the lower margin sinuate.—From photo and scrap of type, I doubt if this is typically in Peru: dets. by Niedenzu as usual, who included *Poeppig 2082* from Tocache which I cite under *S. strigosum*. Illustrated, Pflanzenreich, l.c. page 487 (fruit and stamens with styles). F.M. Neg. 24245.

Loreto: Sand-bank on the lower Aguatia, (*Tessmann 3156*). Flood-free rain forest, Puerto Meléndez, (*Tessmann 4859*). Santa Rosa on the Huallaga, not overflowed area, (*Tessmann 5518*). Brazil to the West Indies; Central America.

Stigmaphyllon strigosum [Poeppig] Juss. Ann. Sci. Nat. sér. 2. 13: 289. 1840; 498. *S. Martianum* Juss. l.c., at least as to Peru.

Except for a sparse pulviform indument, twining branches glabrate, the internodes long, the dichotomous flowering branchlets longer than the leaves, these ovate, truncate at base, shortly acuminate and minutely mucronulate, 5–8 cm. long, 4.5–5.3 cm. wide, subsinuate, rarely sublobate, and minutely glandular at the nerve ends, glabrous above except the midnerve, shortly and softly pubescent beneath; petioles 2.5–4 cm. long, biglandular at tip; peduncles 8–18 mm. long, pedicels a little longer and slenderer; petals fimbriate-ciliate; anthers glabrous; styles foliolately dilated at apex; samara immature, the nut obliquely bicristate, the crests imbricate, the outer and upper broader and replicate above, the wing narrower at base and introrsely appendaged.—Name in another genus in herb. by Poeppig, Jussieu citing number *1941* from "upper Maynas" as type. The species may be doubtful. The more recent collections were distributed by me as *S. puberum*, following Niedenzu's interpretation of that species. The anthers were described as glabrous but the monographer keys the species with *S. tiliaefolium;* probably, as

he admitted for *S. megacarpon* and *S. Gayanum*, the character is not always significant. F.M. Negs. 32420; 19397 (*Martianum*).

Huánuco: Tocache, *Poeppig 1941*, type, and *2082* (this det. Ndz. *S. puberum*).—Junín: Puerto Bermudez, *Killip & Smith 26630.*—Loreto: In shrubs near Yurimaguas, *Poeppig.* Lower Río Huallaga, *Killip & Smith 29004.* Río Mazán, *José Schunke 49* (det. Morton, *S. Kuhlmannii*, det. Standley, *S. fulgens*). Balsapuerto, *Klug 2968; 3075* (both det. Morton, *S. brachiatum;* det. Standley, *S. puberum*). Mishuyacu, *Klug 160.*

Stigmaphyllon tiliaefolium (HBK.) Ndz. Ind. Lect. Lyc. Brunsb. 16. 1900; 496. *Banisteria tiliaefolia* HBK. Nov. Gen. & Sp. 5: 162. 1822. *S. rotundifolium* Juss. Ann. Sci. Nat. sér. 2. 13: 289. 1840, at least as to Peru.

Scandent shrub, the compressed branchlets tomentose, the smooth glabrate branches brown, 3 mm. thick; petioles short or long (to 8 cm. long), the two apical glands sessile, patelliform; leaves subrotund-cordate or the smaller ovate, basally obtuse or acute, shortly acuminate and mucronate, 4–9(12) cm. long, 3–7(14) cm. wide, revolutely repand, (or in Peru plane) and the nerves—these prominent beneath—terminating in short glands, membranous or chartaceous, glabrate above except the nerves, more or less tomentose or sericeous beneath; peduncles 3–5 mm. long, the pedicels 2–4 mm. long; bracts oblong, 1.5–2 mm. long, the rotund-ovate bractlets 1 mm. long; flowers 16–18 mm. broad, the sepals broadly ovate, the yellow petals pilose without or below, denticulate, orbicular from a cuneate base; filaments in part (unknown in type) as styles S-curved (curved or nearly straight in Peru and subequal), the posterior longer than the anterior, the styles sinuately foliolate; anthers often a little pilose in Peru; samara nut acutely auricled, rugose-cristate or smooth; the wing 2.5 cm. long or longer, the lower margin slightly repand-denticulate.—Name "corrected" by some to "tiliifolium"; the type from Colombia was in fruit, the species floral character therefore by later authors. None of the Peruvian material seems to be entirely in conformity but, as the experienced and intelligent Grisebach observed, species may well be variable and here especially as regards marginal leaf-glands and degree of nutlet crests; anyway it is one of the earliest names in a group of poorly understood or not clearly defined entities. As to the name itself, some authors are using *S. Humboldtianum* (DC.) Juss. because of the existence of the name *Banisteria tiliaefolium* Vent, 1803. There is, however, no

conflict within *Stigmaphyllon*. By the same token *S. fulgens* requires another name. Illustrated, Pflanzenreich, l.c. page 487 (fruit). F.M. Negs. 8017 (var.); 24246 (*rotundifolium*); 12788 (*puberulum*); 37483 (not seen).

San Martín: Tarapoto, *Williams 5606; 6725; 6499* (all det. by me *S. rotundifolium;* leaves firm, densely tomentose beneath).—Loreto: Mouth of the Río Santiago, (*Tessmann 4298; 4916; 5003*). Lower Río Nanay, *Williams 537; 491; 456* (all det. Morton, *S. Kuhlmannii*). Above Pongo de Manseriche, *Mexia 6239* (det. Standley, *S. puberum*). Río Morona, *Killip & Smith* (*Dennis*) *29155*. Boqueron Padre Abad, (*Woytkowski 34401*, det. Cuatrecasas). Bolivia to Mexico; Brazil. "Tejesa" (Mexia).

8. **SPACHEA** Juss.

Trees or sprawling or scandent shrubs, the younger parts reddish or rusty hirsute, rather soon glabrate. Racemes many flowered, pendulous or nodding from the branchlet tips, the bractlets dorsally with oblique-terminal glands. Calyx glands longitudinally adnate. Petals glabrous, anthers and filaments glabrous except the latter hirsute about the annulus of the torus. Styles short, obtuse. Cocci smooth.—Genus commemorates Eduard Spach, Alsatian botanist of the early nineteenth century.

Spachea tricarpa Juss. Ann. Sci. Nat. sér. 2. 13: 326. 1840; 585. *Meckelia multiflora* Mart. ex Griseb. in Mart. Fl. Bras. 12, pt. 1: 26. 1858.

Glabrate shrubby liana, only the younger parts, including the compound inflorescence of slender racemes, more or less strigillose; petioles eglandular, canaliculate, 1–1.5 cm. long; stipules connate between the petioles, ovate, 4–5 mm. long; leaves oblong-elliptic, acute or decurrent at base, rather long-acuminate, often 1.5–2(2.5) dm. long, 4–7 cm. wide, revolute-margined, membranous-chartaceous or firmer, lustrous and glabrous both sides unless puberulent midnerve, biglandular at base beneath with 8–12 prominent primary and secondary reticulate nerves; bracts about 3 mm. long, adnate to peduncle, the many-flowered raceme terminating axillary branchlets and provided with several more or less leafy bracts; bractlets mostly eglandular, 1–1.5 mm. long; both flowers perfect, about 1 cm. wide, the sepals bearing 8 glands, the widely spreading pink or purplish petals so far as known roundish and subentire; carpels 3, styles slightly curved.—Illustrated, Mart. Fl. Bras. 12, pt. 1: *pl. 5*

(as *Meckelia multiflora*); also Pflanzenreich, l.c. page 579. F.M. Neg. 19404.

Loreto: Mishuyacu near Iquitos, *Klug 2561* (det. Standley, *Burdachia prismatocarpa*); *Klug 221* (det. Macbride, *Byrsonima laxiflora*). Caballo Cocha, *Williams 2243*. Amazonian Brazil.

9. GALPHIMIA Cav.

Peruvian species an erect shrub with somewhat glaucous leaves biglandular on margin at base, or on petioles, free stipules and rather showy yellow flowers borne in terminal racemes. Pedicels with a bract at base and two bractlets at the medial articulation. Styles three, free, acute; ovary, as the unappendaged anthers, glabrous. Capsular fruits with three slightly fleshy dehiscing parts.—Name was derived from *Malpighia*.

Galphimia glauca Cav. Icon. 5: 61. *pl. 489*. 1799; 597. *Galphimia gracilis* Bartl. Linnaea 13: 552. 1839; 595. *Thryallis gracilis* (Bartl.) Kuntze, Rev. Gen. 1: 89. 1891. *T. glauca* (Cav.) Kuntze, l.c.

Branches and inflorescences early sparsely rufous sericeous, soon glabrate, slender; leaves oblong-elliptic, obtuse or acute both ends, membranous, soon glabrous, 2–6 cm. long or longer, often 2 cm. wide or wider; stipules subulate, 1–2 mm. long, adnate at base of petioles, these 5–15 mm. long; racemes dense to rather lax, a dm. long or longer; pedicels 5–10 mm. long; petals more or less unequal, the larger about 1 cm. long, the ciliolate blade ovate or subcordate; filaments little unequal; capsules globose, the dark brown seeds with conspicuous radicle.—In Peru probably always cultivated as in most warm regions; variable.

San Martín: In garden at Tarapoto, *Williams 5941*.—Loreto: Caballo Cocha on the Amazon River, *Williams 2374*. Central America; Mexico. "Lluvia de oro" (Williams).

10. LOPHANTHERA Juss.

Trees or shrubs with large leaves and ample inflorescences composed of 1–many nodding racemes, their primary and secondary peduncles apically bibracteolate, the fertile bracts and bractlets eglandular, the sterile with a large gland oblique at the tip. Stipules connate. Pedicels articulate above the base. Calyx 10-glandular. Petals glabrous, clawed, subentire, lutescent. Stamens exserted,

the extrorse anthers glandular-verruculosely appendaged. Ovary glabrous. Fruit consisting of three cocci each keeled dorsally, the basal part often simulating a carpophore.—The related *Acmanthera* Griseb. has pedicels sessile in simple racemes, the bracts and bractlets involucrately congested, petals sericeous without, ovary villous, fruit segments folliculiform; the two species, both Amazonian, are *A. latifolia* (Juss.) Griseb., 608, and *A. longifolia* Ndz., 609, the former with broadly ovate plane-margined leaves sericeous beneath even at maturity, the latter with oblong revolute-margined glabrate leaves.

Lophanthera longifolia (HBK.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 25. 1858; 607. *Galphimia*(?) *longifolia* HBK. Nov. Gen. & Sp. 5: 173. 1822.

Younger parts reddish velutinous, the same puberulent indument more or less persisting on the plane-margined, lucid, concolored, reticulate, cuneately oblanceolate and acutely acuminate leaves that may attain 12 cm. or more and a width of about 7 cm.; petioles slender, 1.5–2.5 cm. long with 2–4 oblong or linear glands near the middle and subulate, slightly connate stipules near the base; racemes to 4 dm. long, flowering peduncles 1–2 mm. long, pedicels clavate, 3–6 mm. long; bracts lanceolate, 3 mm. long, the fertile bractlets minute, ovate, the sterile linear, about 3 mm. long and glandular dorsally at tip; flowers 12–15 mm. wide, the erect sepals 10-glandular, the spreading, fleshy, probably yellow petals with 5–6 mm. long, lightly crenulate-revolute blade; fruits 3-parted, each segment 1 cm. long, 3 mm. thick, the narrowed apex from stouter basal "carpophores."—Illustrated, Pflanzenreich, l.c. page 9 (anther, fruit). *L. Spruceana* Ndz., 606, has revolute, soon glabrate leaves, petioles canaliculate, apically biglandular; *L. lactescens* Ducke, 606, younger parts lactescent, fruits without the pseudo-carpophores. F.M. Neg. 37489.

Peru: Probably along the Amazon or tributary. Brazil.

11. MALPIGHIA [Plumier] L.

Shrubs or small trees with entire or spinescent-dentate leaves, slender inconspicuous stipules, usually short petioles. Corymbs or umbels often many-(1–many) flowered, the pedicels as long to three times as long as the floriferous peduncles. Bractlets eglandular. Flowers irregular, the calyx 6–10-glandular with six glands about equal, the sepals not enlarged after anthesis, the petals and stamens

glabrous, one of the former often dentate, ciliate or fimbriate, the latter curved and unequal. Ovary glabrous, the styles always free, simply obtuse or dilated dorsally, the stigmatic surface on the inner angle, somewhat unequal or diverse. Fruit a drupe composed of three 1-seeded pyrenes.

Genus and family named for the first celebrated anatomist, who was also a physician and philosopher, Marcello Malpighi. He was one of the first to use the microscope, and many of his discoveries commemorate his name, as Malpighian layer of the skin, etc.

M. coccigera L. of the West Indies, where known as Singapore Holly, is probably cultivated; it has 1–2 pink flowers and globose red fruits. The even better known Barbados Cherry or Escobillo with 3–8 pink flowers and fruits with thin flesh is *M. glabra* L., which may be Ruiz and Pavón's "ciruela de Fraile" from Chancay that had "fruit with very sweet and cloying taste, its seeds tasting like almonds but very nauseating. In order to mature it must be kept in straw, bran or other matter for several days when it ripens and becomes, from the slight fermentation, as soft as butter, sweet with red flesh."

For ascorbic acid content of *Malpighia* see Science 104: 230. 1946.

Leaves soon glabrous; bractlets lanceolate, barely 1 mm. long or shorter.

Leaves ovate-elliptic-lanceolate, more or less pointed; styles straight, equal..... *M. glabra.*

Leaves distinctly obovate, mostly or all rounded at tip; styles curved, unequal..... *M. punicifolia.*

Leaves tomentose beneath; bractlets ovate, 1.3 mm. long. *M. tomentosa.*

Malpighia glabra L. Sp. Pl. 425. 1753; 617. *M. peruviana* Moric. Pl. Nouv. Amer. 109. 1841. *M. lucida* Pavón ex Juss. Ann. Sci. Nat. sér. 2. 13: 336. 1840.

A shrub 1–4 meters high, soon glabrate including the leaves but early more or less yellowish sericeous; stipules setaceous, deciduous, 1–2 mm. long, petioles 1–3 mm. long; leaves ovate-elliptic to oblong-lanceolate, acute at base, acute or acuminate or sometimes obtuse, to 8 cm. long, 3.5 cm. wide, little revolute, eglandular, chartaceous or subcoriaceous; corymbs 5–15 mm. long-stiped, the flowering peduncles 3–8 mm. long, pedicels 6–15 mm. long, bracts ovate-lanceolate, 1.5–2.5 mm. long, bractlets lanceolate, scarcely 1 mm.

long; flowers white or roseate, 12–16 mm. broad, the sepals oblong or elliptic, the petals obovate or oval to suborbicular, somewhat denticulate, obviously unequal, glanduliferous at base with claw longer or shorter than limb; stamens unequal, the anthers cordate-ovoid, exserted; styles equal; drupes 7–8 mm. long, 9 mm. thick, cherry colored with densely foveolate and medially costate pyrenes.—Jussieu with reason suggested that the origin of the type of *M. lucida* (*M. peruviana*) may be Mexican. Illustrated, Pflanzenreich, l.c. page 620 (flower).

San Martín: Tarapoto, *Ule 6440*. Without locality, *Pavón* (type, *M. lucida*).—Loreto: Iquitos, *Williams 3594*. To Texas and the Antilles.

Malpighia punicifolia L. Sp. Pl. ed. 2. 609. 1762; 622.

Shrub or small tree sometimes about 5 meters tall, the older branches sparsely tubercled with orbicular lenticels; stipules setaceous, obscure, petioles 2–4 mm. long; leaves usually elliptic-lanceolate to obovate, oblong or obovate, obtuse or rounded, rarely mucronulate, sometimes emarginate, 1.5–7 cm. long, 1–3 cm. wide, rarely narrower, plane, membranous-chartaceous, early softly sericeous both sides, becoming glabrate; corymbs or umbels 1–10 mm. stiped, the floriferous peduncles 3–7 mm. long, the pedicels 6–15 mm. long, lanceolate bracts 1–1.5 mm. long, bractlets 0.5–1 mm. long; flowers white or violet or rose-colored, about 13 mm. broad, the sepals ovate (1 glandless, 2 biglandular), the petals unequal, fimbriate at least below, carinate, the claws shorter than the subrotund limbs; 2 stamens stouter, the others with filiform filaments, exserted, the anthers ovoid; styles obviously unequal, the 2 posterior longer and thicker, all truncate or in var. *obovata* Niedenzu somewhat uncinate-compressed; drupes broadly ovoid-globose, rather 3-lobed, juicy, 10–15 mm. thick, the 3 pyrenes cristate and muricate.—*M. retusa* Benth. Bot. Voy. Sulphur 74. 1844 may be a not uncommon form with many leaves emarginate, the type from Isle of Puna south of Guayaquil. Cultivated or at least protected and the edible fruit harvested as "cereza" or "Barbados cherry"; it is pleasantly aromatic but acid and improved by cooking with sugar (Dahlgren). Illustrated, Dahlgren, Trop. & Subtrop. Fruits, Chicago Nat. Hist. Mus. Pop. Ser., Bot. 26: 46. 1947.

San Martín: Moyobamba, *Weberbauer 4673*. Tarapoto, *Williams 6754*.—Tumbez: Plain near Hacienda La Choza, *Weberbauer 7731*. To Mexico and the Antilles. "Cereza de la sabana" (Weberbauer).

Malpighia tomentosa Pavón ex Moric. Pl. Nouv. Amer. 111. *pl. 68.* 1841; 617.

Shrub, the new branchlets, inflorescence and leaves softly whitish or yellowish tomentose; stipules subulate, scarcely exceeding 1 mm.; petioles to 4 mm. long, leaves ovate, rounded at base, acute, rounded or even emarginate to 3.5 cm. long, 2.5 cm. wide, plane, membranous-chartaceous, the adult only puberulent above, the six primary nerves scarcely conspicuous; umbels 4-flowered, the common peduncle about 1 cm. long, floriferous, 2–3 mm. long, pedicels about 4 mm. long; flowers 10–13 mm. wide, the calyx with 10 glands, the thick roseate reflexed petals cordate-orbicular, cochleate, denticulate, the nearly plane, smaller, fifth one glandular-fimbriate; stamens little exserted, two thicker, filaments two-thirds connate, anthers subglobose; styles straight; immature ovoid drupe 6 mm. long.—Perhaps even probably, as suggested by Jussieu, from Mexico. F.M. Neg. 24216.

Peru(?): Without data, "*Pavón,*" type.

12. BUNCHOSIA Richard ex Juss.

Small trees or erect shrubs, at least the younger parts more or less pubescent, with entire leaves and axillary, mostly many-flowered and elongate racemes of small flowers, the bractlets usually with 1(–2) conspicuous gland. Stipules small, linear-lanceolate, acute, interpetiolar. Calyx glands 10, in part more or less connate, the sepals not enlarged. Petals and stamens glabrous, the filaments more or less joined at base as also the styles or these free, obliquely obtuse or capitellate, the ovary glabrous or sericeous. Pyrenes 2 or 3, smooth.—The name was derived from the Arabic "bunchos," meaning coffee, which the pyrenes simulate and which are said to serve as a substitute. Species (as accepted) very difficult to distinguish, the key only suggestive. With the approach so usual to some monographers, key characters are often "destroyed" in varietal distinctions. While characters of styles and ovary are not always constant they are usually and thus convenient as any for separating herbarium material as determined.

Styles soon free or partly so; anther connective, except *B. media,* elongate; leaves in general oblong-, elliptic-, or ovate-lanceolate.

Ovary sericeous, 2-celled; connective dark, elongate; leaves said to vary in glands.

Flowers about 14 mm. broad.....*B. armeniaca.*

Flowers about half as large.....*B. angustifolia.*

Ovary glabrous or nearly, typically 3-celled; connective yellow, shorter than cells; leaves with 2 glands beneath next to midnerve, glabrate.

Flowers at most 1.5 cm. wide, the petals not equally glandular. *B. media.*

Flowers often about 2 cm. wide, all the petals glandular-ciliate. *B. maritima.*

Styles connate (cf. also *B. armeniaca*); anther connective, except *B. glandulosa,* short; leaves as noted below.

Ovary glabrous; connective dark, equaling or longer than cells; leaves soon glabrous, biglandular beneath at base, narrowly lanceolate-ovate unless in Peru.....*B. glandulosa.*

Ovary pubescent; connective dark (except *B. lanceolata*), short; leaves (unless *B. lanceolata*) usually broadly elliptic or ovate-elliptic, the glands more or less above base, marginal or lacking (glands sometimes nearly basal, *B. Hookeriana*).

Connective dark; leaves about 6(10) cm. wide.

Leaf-acumination variable; drupes about 1 cm. thick. *B. Lindeniana, B. Hookeriana.*

Leaf-acumination regularly distinctive, caudate; drupes 2 cm. thick.....*B. elliptica.*

Connective yellow; leaves glabrous, (2)3–4.5(8) cm. wide, about twice as long.....*B. lanceolata.*

Bunchosia angustifolia Juss. Ann. Sci. Nat. sér. 2. 13: 324. 1840; 665.

Resembles *B. armeniaca;* branches canescent, the oval lenticels scarcely conspicuous; petioles 5–7 mm. long; leaves oblong-lanceolate, to 10 cm. long, 4 cm. wide, deep green; racemes little shorter than the leaves; flowers half as large, the green calyx with yellow glands, the twice as long denticulate spreading petals yellow; stamens reddish, exserted; styles nearly distinct, stigma capitellate; drupes ovoid, nearly 2.5 cm. long, greenish-red.—Probably is a variant of *B. armeniaca* as suggested, apparently by Cavanilles. The Weberbauer specimen with little elongate anther-connective and leaves 7–9 cm. long, 2.5–3 cm. wide, is doubtful, but placed here by Niedenzu.

Junín: Huachihuachi, *Weberbauer 6546.* Without locality, *Jos. de Jussieu,* type. Without locality, (*Mathews*). Bolivia. "Ciruela."

Bunchosia armeniaca (Cav.) DC. Prodr. 1: 582. 1824; 664. *Malpighia armeniaca* Cav. Diss. 8: 410. *pl. 238.* 1789. *Byrsonima nitida* [R. & P.] G. Don, Gen. Syst. 1: 636. 1831.

Shrub or tree 4–12 meters high, the younger parts appressed sericeous, the branchlets a little complanate below the nodes, the branches terete, striate; stipules calliform-acute, connivent, 0.5–1 mm. long; petioles stout, 4–10 mm. long; leaves narrowly ovate to oblong or ovate-lanceolate, obtuse or shortly narrowed at base, shortly to long-acuminate, to 24 cm. long, 11 cm. wide, scarcely revolute, chartaceous or subcoriaceous, the adult glabrate, green, more or less lustrous, laxly reticulate-veined, primary nerves 6 or 7, frequently glandular-maculate beneath; racemes often geminate or ternate to 40-flowered and 13 cm. long, common peduncles 1–3.5 cm. long, floriferous 1–5 mm. long; pedicels 2–6 mm. long, all enlarged; bracts ovate-lanceolate, 1.5–2.5 mm. long, bractlets ovate, very acute, 1 mm. long; flowers 14 mm. broad; sepals ovate, ciliate, glands oblong-obovate, petal limb orbicular, more or less glandular-ciliate; filaments to two-thirds connate, anthers subrotund, the broad connective a little produced, brown; ovary 2-celled, sericeous, styles distinct (or rarely connate); drupes subsericeous, ovoid, 2.5 cm. long, 2 cm. in diameter.—Jussieu in Ann. Mus. Hist. Nat. Paris 18: 481. 1811 merely established the genus (for Richard), listing the species under *Malpighia;* therefore the authority for the name is as above, not (Cav.) Rich. ex Juss. l.c., as often written.

Fruit with thin dark red skin with sweet dryish pulp. The forma *systyla,* styles connate, may not belong here or the character variable; cf. *B. lanceolata,* forma *leiocarpa* and *B. glandulosa.* The Loreto specimens, all apparently with connate styles, are quite possibly rather *B. Hookeriana* but all characters are not discernible. The species type, without locality, by Jussieu.

Cajamarca: Nanchó, *Raimondi.*—Lima: Chancay, *Ruiz & Pavón* (type, *B. nitida*). Huertas, *Raimondi.*—Huánuco: Near Huánuco, *Ruiz & Pavón.* Huacar near Ambo, *Raimondi.*—Ayacucho: Open woods, Aina, *Killip & Smith 22811*? (distr. as *B. fluminensis*).—Amazonas: Chachapoyas, (*Mathews,* forma *systyla*).—Loreto: Flood-free wood near Soledad, (*Tessmann 5276,* forma *systyla,* Niedenzu). Yurimaguas, *Mathews; Killip & Smith 28219*? Soledad, *Killip & Smith 29776* (forma *systyla,* so cf. *B. Hookeriana*). Balsapuerto, *Killip & Smith 28419*? Colombia to Bolivia and Brazil. "Ciruelas de Frayle," "ciruela de causaboca" (Raimondi).

Bunchosia elliptica Todaro, Index Sem. Hort. Panorm. 38. 1877; 662.

Apparently like *B. Hookeriana* but leaves all acuminate, flowering peduncles 2–4 mm. long, equaled by the pedicels; filaments to two-thirds connate; connective broadly ovoid (instead of globose), little longer than the cells; drupes 2.5 cm. long, 2–2.5 cm. in diameter.—Description after a cultivated specimen from the garden in Palermo, possibly a variety (Niedenzu). The leaf margins are crumpled, the acumination sharp except in the Poeppig specimens, which may be *B. Hookeriana*. Trunk straight, round, slender, the pale bark with many anastomosing fissures; shrub or small tree often cultivated for its red fruit (Williams). F.M. Neg. 32418 (*Poeppig*).

Loreto: Yurimaguas, (*Poeppig 2315*, fide Niedenzu); *Williams 5007*. Mishuyacu, *Klug 925*. Iquitos, *Williams 1427*. Caballo Cocha, *Williams 2127*. Lower Río Nanay, *Williams 404*. "Ciruela japonesa" (Klug), "oreja de buro," "ciruela de la china."

Bunchosia glandulosa (Cav.) DC. Prodr. 1: 581. 1824; 665. *Malpighia glandulosa* Cav. Diss. 8: 411. *pl. 239*. 1789.

Similar to the related *B. armeniaca*, but the ovary glabrous and the apparently always connate styles about twice as long, instead of scarcely longer; branches densely tuberculate with orbicular lenticels; petioles slender, 5–15 mm. long; leaves often lanceolate, acute at base, 3–11 cm. long, 1–3.25 cm. wide, often membranous, adult glabrous, biglandular beneath at base or above; racemes 4–16-flowered to 5 cm. long, pedicels 4–9 mm. long; flowers 10–12 mm. broad, whitish, the sepals oblong; drupes about half as large.—The Peruvian specimen (not seen by me) is forma *latifolia* Ndz., the leaves obtuse or obtusely acuminate, 8–11 cm. long, 3.5–5 cm. wide; I doubt if it really belongs here. The authority "(Cav.) Rich." is not justified, since Jussieu, Ann. Mus. Hist. Nat. Paris 18: 481. 1811, while establishing the generic name for Richard, listed the species under *Malpighia*.

Río Acre: Seringal San Francisco, (*Ule 9476*). Yucatan; West Indies.

Bunchosia Hookeriana Juss. Ann. Sci. Nat. sér. 2. 13: 324. 1840; 662.

Older discolored branches rather prominently lenticellate; stipules 1–1.5 mm. long, petioles canaliculate above, 5–10 mm. long;

leaves broadly ovate, elliptic or obovate, abruptly narrowed at base, acuminate or obtuse, to 15 cm. long, 10 cm. wide, revolute margined, coriaceous, the adult green and glabrate both sides or under a lens minutely and sparsely pubescent with soft trichomes, metallic beneath, the 4–5 primary nerves prominent both sides, anastomotic-reticulate, with two gland-like spots at midnerve more or less near base beneath and a few much smaller glands at the margins; racemes to 6 cm. long, common peduncle 2–3 cm. long, floriferous 2 mm. long, pedicels 3 mm. long (or in fruit 5 mm.), subulate bracts 1.5–2 mm. long, ovate-acute bractlets 1 mm. long; flowers scarcely 1.25 cm. broad, the linear-oblong calyx glands apparently eight, the ovate segments little puberulent, ciliate; petals of *B. Lindeniana* but smaller; anther connective brown; ovary sericeous, 2-celled, the drupe 12 mm. long, 9–12 mm. in diameter.—Determinations mostly by Morton; some of the material doubtful, as insect eaten or incomplete; could be *B. armeniaca*. *B. argentea* (Jacq.) DC. would be sought here and is marked by leaves very sericeous beneath. F.M. Neg. 23017.

San Martín: Tarapoto, *Spruce 4542*, type; *Ule 6532; (Mathews)*; *Williams 5443; 6063; 6222; 6739*. Lamas, *Williams 6436*. San Roque, *Williams 7328*. Pongo de Cainarachi, *Klug 2759*. Juanjuí, *Klug 3770*.—Loreto: Yurimaguas, *Williams 3913; Killip & Smith 28122; 28124; 28359; 28230*? Puerto Arturo, *Killip & Smith 27768; 27778*. Santa Rosa, *Killip & Smith 28884*. San Ramón, *Williams 4568*. "Sacha-Ynoan" (Williams).

Bunchosia lanceolata Turcz. Bull. Soc. Nat. Mosc. 36: 582. 1863; 653.

Becoming a small tree, the younger parts sparsely sericeous, the branches ashy-brown with a few orbicular or oval lenticels; stipules linear-lanceolate, 2–4 mm. long, the subglabrate petioles 6–10 mm. long; leaves elliptic or lanceolate-oblong, acute or obtuse at base, acuminate, 6–20 cm. long, 2–4.5(8) cm. wide, revolute, the adult glabrous or essentially, green, rather lustrous, coriaceous, with two nerves beneath above the base and the five primary nerves axillary reticulate, prominent; racemes finally subglabrate, 12–18-flowered, 4–6 cm. long, the common peduncle 1.5–2 cm. long, the floriferous 1.5–3 mm. long; pedicels 4–5 mm. long; bracts linear or nearly 2–6 mm. long, the ovate bractlets 1–2 mm. long; flowers 1.75 cm. wide, the ciliate ovate sepals puberulent without, the yellowish ovate-obovate subequal petals lacerate-dentate, the fifth (at least) glandular; filaments to one-third connate; anthers subglobose, nearly

1 mm. long; ovary sericeous; drupe compressed-spheroid to 16 mm. long, 1.5–2 cm. in diameter.—Related species include *B. glandulifera* (Jacq.) HBK., 651, and *B. cornifolia* HBK., 652, with pubescent leaves and submarginal glands, the latter possibly a narrow-leaved variant of the former. The Peruvian plant is forma *leiocarpa* Ndz. Bol. Mus. Hist. Nat. Lima 5: 328. 1941.

Amazonas: Chachapoyas, (*Raimondi*, det. Niedenzu). Bolivia to Mexico.

Bunchosia Lindeniana Juss. Arch. Mus. Paris 3: 335. 1843; 661.

Younger parts yellowish or ashy appressed sericeous, the brown branches with orbicular lenticels; stipules 1 mm. long; petioles subglabrate, 5–11 mm. long; leaves ovate-elliptic or -oblong, acute at base, mostly acuminate, to 14 cm. long, nearly half as wide, undulately revolute-margined, more or less coriaceous, in age glabrate above, puberulent beneath, the midnerve and 6–7 primary nerves prominent, the two glands opposite above the base, sometimes obsolete or obscure; racemes 3–7 cm. long, common peduncles 1.5–3 cm. long, the floriferous 2–3 mm. long, pedicels twice as long; bracts ovate-lanceolate, the lower to 3.5 mm. long, upper scarcely 2 mm. long, the ovate acute bractlets 1 mm. long; flowers to 15 mm. broad, the glandular sepals broadly ovate, the whitish petals with cordate-ovate limbs basally or in the fifth completely glandular-dentate; stamens exserted medially connate, the anther cells at base of connectives purplish; ovary 2- or 3-celled, densely sericeous, the connate styles with peltate stigmas; drupe spheroid, more than 1 cm. in diameter.—The Peruvian plant det. Niedenzu as var. *boliviensis* Ndz. has leaves obscurely if at all glandular, ovary 2-celled, drupes 1- or 2-celled, but this Raimondi specimen has yellow flowers and it might rather be referable to *B. angustifolia!* However, the species itself may be found to be a part, properly, of *B. Hookeriana.* Said to attain 15 meters or more.

Junín: Huancamayo, *Raimondi.* Mexico; Bolivia. "Quita yerba Santa" (Raimondi).

Bunchosia maritima (Vell.) Macbr., comb. nov. *Malpighia maritima* Vell. Fl. Flum. Icon. 4. *pl. 173.* 1827. Text 194. 1825. *B. fluminensis* Griseb. in Mart. Fl. Bras. 12, pt. 1: 31. 1858; 659.

Branchlets and leaves beneath puberulent, the glabrate branches brownish-canescent at the dilated nodes and a little scabrous, with

oblong lenticels; stipules lanceolate, connivent, 1–1.5 mm. long; petioles sericeous, 5–11 mm. long; leaves oblong- or ovate-lanceolate, mostly rounded at base, usually acuminate, to 22 cm. long, 8 cm. wide, revolute, chartaceous, green both sides, glabrate above the midnerve and 6–8 primary nerves, rather prominent and laxly reticulate beneath, with two impressed glands about 2 cm. above the base at the margins; racemes many-flowered, 3–8 cm. long, the common peduncle 2–4 cm. long, the floriferous scarcely 1 mm. long; pedicels 4–6 mm. long; bracts ovate, 1.5–2 mm. long, bractlets abruptly acuminate, scarcely 1 mm. long, with two scutellate lateral glands or these more or less merged; flowers 15–17 mm. broad, the ovate acutish sepals medially pubescent and ciliate, the glands oblong, all the yellow petals glandular ciliate and all around; stamens well-exserted, filaments one-half to two-thirds connate; ovary 3-celled, glabrous, or a little sericeous, the distinct styles 2 or 3, capitellate; drupes usually biocellate, 10–12 mm. long, 8–13(16) mm. in diameter.—Said to attain 15 meters. According to Niedenzu there is a connate-styled form. Illustrated, Pflanzenreich, l.c. page 650 (flower and drupe).

Peru (probably). Colombia to southern Brazil.

Bunchosia media (Ait.) DC. Prodr. 1: 581. 1824; 654. *Malpighia media* Ait. Hort. Kew ed. 2. 3: 103. 1811.

Rather similar to *B. lanceolata* but more pubescent, the leaves glabrate even at maturity and usually narrower, cuneate at base, shortly and obtusely acuminate, to 11 cm. long, 4 cm. wide, the two glands beneath 1–2 cm. above the base; stipules 1 mm. long; pedicels 5–7 mm. long; flowers to 15 mm. wide, the sepals oblong, with ten distinct glands, the whitish or yellowish petals with orbicular limb; anthers ovoid, less than 1 mm. long; ovary glabrous, 3(2)-celled.—The Peruvian specimen by Mathews is forma *bicarpellaris* Ndz., the ovary 2-celled; it seems probable, in view of range, that it is referable to *B. angustifolia*, at least sens. Niedenzu. F.M. Neg. 24224 (the forma).

Peru: Locality not given, (*Mathews 3124*). Central America; West Indies; Brazil (Cutt.).

13. **DICELLA** Griseb.

Deciduously appressed canescent or lutescent sericeous liana or the indument of the panicles often aurescent and always extending to the obovate petals without, the sepals enlarged after anthesis.

Floriferous peduncles articulate above the middle and bibracteolate. Ovary usually bicarpellate, sericeous, the nut by abortion 1-celled, 1-seeded. Styles short, straight, obliquely dilated toward the tip, the stigma on the interior angle.

Dicella macroptera [Mart.] Juss. Ann. Sci. Nat. sér. 2. 13: 323. 1840; 676. *Thryallis macroptera* Mart. Flora 24: Beibl. 2: 104. 1841.

Branches finally glabrate, 3 mm. thick; petioles sericeous, flexuose, 1–1.5 cm. long; leaves ovate or lanceolate-ovate, more or less cordate at base, obtuse or acutish-acuminate, to 1.5 dm. long, 8 cm. wide, little revolute and with many evanescent glands, coriaceous or chartaceous, adult glabrous, lustrous above, concolor, opaque beneath, densely reticulate, all the nerves rather prominent above, the 6–8 primary very conspicuous beneath; common peduncle 1.5–3(5) cm. long, flowering 4–8 mm. long, pedicels (1)1.5–2 cm. long; bracts and bractlets oblanceolate, erect-spreading, subplane, the former to 11 mm. long, the latter to 8 mm. long, half as wide, many glands at lower margins; sepals glabrous and lustrous, unequal, the two twice as large ones to 4 cm. long, 1.5 cm. wide; nutlet typically sericeous, costate, to 11 mm. long, 15 mm. thick.—The Peruvian specimen has glabrate nutlets more strongly ridged-angled. Flowers not known. A shrub or tree, the branches dependent over a cliff; bracts bright green (Killip & Smith). F.M. Neg. 12837.

Junín: Along Río Perené, *Killip & Smith 25241*. Brazil.

14. BYRSONIMA Rich. ex Juss.

Shrubs, rarely trees, with entire leaves and terminal, usually simple and many-flowered racemes, the floriferous peduncles short or obsolete, the pedicels more or less stiped, mostly subsessile. Stipules interpetiolar, often connate. Petioles ordinarily short and stout. Sepals commonly biglandular. Petals long-clawed, the claw of only one straight, yellow, cordate or reniform-orbicular, subentire, subequal. Torus densely hirsute, the filaments scarcely connate, the anthers glabrous or pilose. Styles subulate, straight or early curved at tip. Drupe pulp thin.—The name refers to the use of some species for tanning. For *B. nitida* (R. & P.) G. Don see *Bunchosia armeniaca*.

The related *Diacidia galphimioides* Griseb., 763, northern Amazonian, could occur and would be distinguished by the large bracts and bractlets (6–8 mm. long) and bicornute, basally barbate anthers;

otherwise like *Byrsonima*. For the recently segregated *Alcoceratothrix* Ndz., likewise to be expected within Peru, see *B. stipulina*.

Besides the following there is a collection noteworthy but too immature for description: *Klug 2233*, Florida, Loreto with Huitoto name "Veropeco-ey"; it was distributed as *B. spicata* (*B. coriacea* var. *spicata*) but nerves few as in *B. crassifolia* and *B. Poeppigiana;* however, the leaves are appressed sericeous beneath.

Anther cells appendaged or shorter than conspicuous connective; leaves glabrous or with a few minute trichomes.

Stipules one cm. long or longer; uppermost leaves subsessile. *B. stipulina.*

Stipules at most a few mm. long; the leaves often petioled.

Leaves subsessile, mostly subrotund; anther cells and connective obtuse, the former pubescent apically *B. coccolobifolia.*

Leaves distinctly ovate or ovate-lanceolate, petioled.

Anthers linear, aristate, pubescent; leaves epunctate. *B. fluminensis.*

Anthers with conoid appendage, glabrous; leaves punctulate and opaque beneath..... *B. densa.*

Anther cells and inconspicuous connective subequal; leaves sometimes glabrous at maturity.

Lateral leaf nerves many, mostly or all less than 5 mm. distant; leaves usually oblong- or elliptic-lanceolate and ordinarily obviously pubescent at least near or on nerves beneath, even in age; anthers usually glabrous.

Leaves persistently or typically evenly pubescent beneath. *B. sericea, B. chrysophylla.*

Leaves deciduously pubescent beneath, usually unevenly. *B. coriacea.*

Lateral leaf nerves usually fewer than 12 and many if not all at least about 8 mm. distant; anthers pubescent unless in *B. laxiflora.*

Pedicels sessile; bracts and bractlets caducous, nearly glabrous within; anthers pubescent, cells about parallel. *B. crassifolia.*

Pedicels mostly or all more or less peduncled; bracts as bractlets tardily deciduous; anthers pubescent unless in *B. laxiflora.*

Anthers pubescent, the cells divergent; leaves often obovate and about one-half as wide as long.

Leaves finally glabrous, the nerves rather more prominent above than beneath; ovary glabrous (type). *B. arthropoda.*

Leaves more or less pubescent, the nerves more prominent beneath than above; ovary sericeous. . .*B. Poeppigiana.*

Anthers glabrous, the cells described as parallel; leaves glabrous or nearly, often oblong-elliptic, about one-third as wide as long. . . . . *B. laxiflora.*

Byrsonima arthropoda Juss. Ann. Sci. Nat. sér. 2. 13: 335. 1840; 713.

Tree, the usual early pubescence of two forms of more or less reddish trichomes and dense, the branches and mature leaves glabrous; stipules confluent at base; petioles 1–2 cm. long; leaves somewhat oblanceolate-obovate, obliquely acute, narrowed at base and decurrent, to 16 cm. long, 8 cm. wide, often smaller, chartaceous, a little lustrous above, paler beneath, drying dark, the 9–10 parallel nerves as the reticulation prominent especially above; racemes many-flowered, 6–10 cm. long, peduncles 2 cm. long, floriferous bibracteolate below the apex, 1–2 mm. long, pedicels 6–7 mm. long, bracts recurved, linear-lanceolate, 2–3 mm. long, the bractlets ovate, 1 mm. long; flowers 1.5 cm. broad, yellow or orange, the sepals puberulent, the petals cordate; filaments densely hirsute, the oblong anthers pilose with divergent cells and enlarged connective; originally described as glabrous, but according to Niedenzu sericeous at tip.—Tree several to 25 meters tall; *Williams 5157* has fruits about 1.5 cm. thick. F.M. Neg. 12864.

San Martín: Chazuta, *Klug 4003* (det. Standley, *B. fluminensis*).—Loreto: Near Yurimaguas, *Poeppig 2214*, type; *Williams 5157*. Balsapuerto, *Klug 2919; 2993* (both det. Standley, *B. fluminensis*). Río Mazán, *José Schunke 218* (det. Morton). High wood near Camaría, *Tessmann 3327*. Yarina Cocha, *Tessmann 3480*. Soledad, *Tessmann 5295*. Brazil. "Runo-caspi."

Byrsonima chrysophylla HBK. Nov. Gen. & Sp. 5: 150. 1822; 704. *B. peruviana* Juss. Ann. Sci. Nat. sér. 2. 13: 333. 1840, fide Ndz. *B. peruviana* Juss. var. *eglandulosum* Juss. l.c.

With the general characters of *B. coriacea*, but the leaves as all the younger parts densely tomentose with crisped early reddish trichomes that persist, especially on the leaves beneath; leaves about oblong, decurrent at base, typically long-acuminate, 6–15 cm.

long, 2.5–5.5 cm. wide; petioles 5–15 mm. long; stipules to 3 mm. long; ovary glabrous or a little sericeous at tip; calyx typically glandular, sometimes eglandular (forma *Kunthiana* Ndz.).—Type from San Carlos del Río Negro, Venezuela; Standley maybe rightly referred all the following to *B. spicata* (see *B. coriacea*). F.M. Neg. 24232.

San Martín: Near Moyobamba, *Mathews 1460* (type, *B. peruviana*); and at 860 meters, *Weberbauer 4522a; 4507;* 290. Zepelacio, *Klug 3253.* Lamas, *Williams 6430.* Tarapoto, *Williams 5381; 5805; 6677.* Rioja, *Woytkowski 18.* Brazil; Venezuela. "Quilla Sisa," "indano," "yndano."

Byrsonima coccolobifolia HBK. Nov. Gen. & Sp. 5: 148. 1822; 749.

Shrub or small tree soon glabrous or glabrate except the pedicels, these reddish-sericeous as the branchlet tips and new leaves; stipules 2–3 mm. long, the petioles only 0.5–1.5 mm. long; leaves ovate, roundish or obovate, more or less cordate at base, to 15 cm. long, 7–10 cm. wide, often emarginate, plane, coriaceous, nervose; racemes to 1.5 dm. long, peduncles to 4 cm., pedicels 6–9 mm. long; bracts and bractlets lanceolate-ovate, the former 2–3.5 mm., the latter 1–1.5 mm. long; flowers to 14 mm. broad, the apically recurving sepals glabrous without, pilose within; petals white to deep rose (Sandwith), the claws of all straight; anther cells strigose, linear, the connective appendage one-third to one-half as long; ovary glabrous; drupes globose, cusped, to 8 mm. thick.—*B. rotunda* Griseb., 751, of Brazil, to which at one time *Weberbauer 4596* was referred, is apparently a form differing chiefly in the persistently puberulent leaves, especially beneath, that are obtuse or even decurrent at base. Illustrated, Pflanzenreich, l.c. page 758. F.M. Neg. 37496.

San Martín: Grassy cliffs on the Mount Morro near Moyobamba, *Weberbauer 4596;* 290. Paraguay to Colombia and the West Indies.

Byrsonima coriacea (Sw.) DC. Prodr. 1: 580. 1824; 699. *Malpighia coriacea* Swartz, Prodr. 74. 1788.

Tree, sometimes about 40 meters high, the branchlet tips and many-flowered racemes as the new leaves densely sericeous with rusty or reddish appressed trichomes; stipules broadly ovate, 1.5–2.5 mm. long; petioles usually 4–11 mm. long; leaves narrowed at base, typically lanceolate, usually elliptic- or oblong-lanceolate, often rather long-acuminate, 3–18 cm. long, 1–5.5 cm. wide, little revolute, typically coriaceous, in Peru chartaceous, adult glabrous

and lustrous above, more or less distinctly pinnate-nerved, in Peru distinctly, the nerves very many; common peduncles 1–3 cm. long, floriferous mostly none, pedicels 7–15 mm. long; bracts and bractlets mostly ovate, persisting, straight or nearly, acute, the former about 2 mm. long, the latter 0.5–1 mm. long; flowers about 1.5 cm. wide, the ovate sepals obtusely acuminate and recurved at tip, the orange or deep yellow petals with reniform-concave limb, much recurved claw; anthers linear-oblong, glabrous or slightly sericeous, the cells and connective subequal; ovary glabrous or sericeous apically; drupes globose, to 1.25 cm. in diameter, the bony seeds verrucose.—The Peruvian plant is var. *spicata* (Cav.) Ndz. (also in the West Indies?), the oblong- or elliptic-lanceolate chartaceous leaves with many distinctly pinnate nerves; cf. the too similar *B. crassifolia* with which it probably hybridizes (Sandwith, Kew Bull. 314. 1935). Cf. also *B. lancifolia* Juss. under *B. sericea*, to which, if distinct, some material could be referred. The bark, according to Raimondi, is used in Puno in medicine, probably as *B. crassifolia*, and is known as "Chanchi." Illustrated, Pflanzenreich, l.c. page 9 (embryo) and page 697 (branchlet, flower).

Junín: La Merced, *5397*. San Ramón, *Killip & Smith 24778; 24799; 24892; Seibert 2191*. Hacienda Schunke, *Schunke 76; 107; 311; 422; 424*.—Loreto: Río Mazán, *José Schunke 114* (det. Standley). —Puno: (*Raimondi*). Without locality, *Ruiz & Pavón*. Tropical South America; West Indies. "Chanchi."

Byrsonima crassifolia (L.) HBK. Nov. Gen. & Sp. 5: 149. 1822; 718. *Malpighia crassifolia* L. Sp. Pl. 426. 1753.

Shrub or small tree, the newer parts rather densely and reddish or rusty puberulent, this indument sometimes persisting, especially on the coriaceous, mostly elliptic or somewhat obovate leaves beneath; stipules ovate, 3–5 mm. long; petioles 5–15 mm. long; leaves acute or somewhat obtuse at base, shortly and obtusely acuminate or nearly obtuse, revolute, finally glabrate and lustrous above, opaque and sometimes glabrate beneath where reticulate and prominently nerved, the primary nerves 7–10; racemes elongate, often somewhat composite, the peduncles 2–3.5 cm. long, the 2–3-flowered floriferous to 4 mm. long, the pedicels 9–12 mm. long; bracts ovate, 2–3 mm. long, acuminate, caducous as the bractlets, these half as long or narrower and 3–5(–7) mm. long; flowers yellow, 1.5–2 cm. wide, the sepals ovate, the petal limb 5–7 by 7–9 mm., the claw 4–5 mm. long; stamens long-exserted, the torus trichomes nearly

as long as the filaments; anthers linear or oblong, the pilose cells and connective about equal; ovary glabrous or somewhat sericeous; drupes globose 5–7(–12) mm. thick, the ligneous seeds minutely verrucose or costate.—Larger leaves to 2 dm. long, 1.5 dm. wide, soon plane above, more or less glabrate beneath in the typical form; in var. *peruviana* Ndz. leaves lanceolate, acuminate to 1.5 dm. long, 4.5 cm. wide, the ovary hirsute. Jussieu himself in 1843 wrote *B. crassifolia* (L.) HBK., not (L.) Rich. as by some authorities; in Ann. Mus. Hist. Nat. Paris 18: 481. 1811, he established the genus name for Richard but listed the species under the name *Malpighia*. A. C. Smith found the bark pounded to a pulp and used as a poultice in British Guiana; cf. note under *B. coriacea*. It is possible that the Weberbauer specimen and the Raimondi one, both from Puno, are really the same, in spite of the fact that both were determined by the monographer himself.

Puno: Between Sandía and Chunchusmayo, 1,800 meters, (*Weberbauer 1107*, type, the var.); 278. To Mexico and the West Indies.

Byrsonima densa (Poir.) DC. Prodr. 1: 580. 1824; 744. *Malpighia densa* Poir. Encycl. Suppl. 4: 7. 1816. *B. amazonica* Griseb. in Mart. Fl. Bras. 12, pt. 1: 14. 1858, fide Kostermans.

Shrub or tree essentially glabrous except for the new tips and stipular trichomes that may persist, the stipules connate at base, 1 mm. long; petioles a little margined, 4–10 mm. long; leaves oblong or oblanceolate, cuneate at base, typically obliquely and obtusely short-acuminate, 5–12(15) cm. long, 2–4.5(6) cm. wide, chartaceous, revolute, green and smooth between the 8–10 primary nerves above, more or less opaque or glaucous-green beneath; racemes simple, 5–10 cm. long, dense, the peduncle 1.5 to 3 cm. long, the crowded slender pedicels 7–10 mm. long; bracts and bractlets ovate, rounded, obtuse, 1–1.5 mm. long; flowers fragrant, to 1 cm. wide, variously colored; sepals ovate, with obovate glands; petal limb cochleate, subentire or erose; stamens exserted, anthers elliptic, glabrous, with a conspicuous obtuse conoid appendage about 1.25 mm. long; ovary glabrous.—The *B. amazonica* var. *lucidula* (Huber) Ndz. has leaves lustrous beneath and with acumen to 1 cm. long, the 5–6 primary nerves little prominent. Tree to 30 meters (Krukoff). F.M. Negs. 12861; 24230; 24231 (var.).

San Martín: Rioja near Moyobamba, 800 meters, *Weberbauer 4693;* 290. Amazonian Brazil; Guiana.

Byrsonima fluminensis Ndz. Arb. Bot. Inst. Lyc. Brunsb. 1: 43. 1901; 756.

Glabrate except stipules, younger racemes and the growing sericeous tips of the new branchlets; stipules ovate, connate, 1.5 mm. long or the upper subulate and longer, the inner trichomes often persisting; petioles slender, terete, 1–1.5 cm. long; leaves elliptic-lanceolate or oblong, acute both ends or acuminate at apex, chartaceous, lustrous above, paler beneath, plane, to 14 cm. long, 4.5 cm. wide, subpinnately nerved, the (6)10–13 primary nerves but slightly more prominent than the others; racemes about 20-flowered with peduncle to 2 cm. long, the sessile pedicels 5–10 mm. long, the rounded bracts and bractlets typically scarcely 1 mm. long; flowers 12–15 mm. wide, the ovate sepals with oblanceolate glands, the limb of the clawed petals 5–6 mm. long, said to be yellow but in Peru roseate with yellow filaments; anthers linear, the hirsutulous cells nearly bicornute with setae longer than the thick connective; ovary glabrous unless for a few trichomes.—To 25 meters high, the bark with coarse shallow fissures (Williams). The Peruvian material is not typical but too many species have been proposed on differences doubtfully constant, as variations in bracts, anther appendages and connective; the species thus, among others, is similar to *B. japurensis* (Mart.) Juss., page 755 and *B. laevigata* (Poir.) DC., page 756 with subequal anther appendages and connective, the leaves of the former species puberulent; there is a general resemblance to *B. arthropoda* with pubescent but earistate anthers. F.M. Neg. 12875.

Loreto: Flooded forest near Iquitos, (*Tessmann 3656; 5200*). Mishuyacu, *Klug 1542; 2519* (det. Standley, *Burdachia prismatocarpa*). Caballo Cocha, *Williams 2348; 2500*. La Victoria, *Williams 299* (distr. as *B. coriacea*). Brazil. "Murushí," "muricy."

Byrsonima laxiflora Griseb. Linnaea 13: 256. 1839; 696.

Tree, sometimes 10 meters high, the younger parts sparsely rusty sericeous; stipules 1.5– nearly 3 mm. long; petioles slender, 1–2 cm. long; leaves elliptic, oblong or lanceolate, very acute at base, acute or acuminate, 4–14 cm. long, 1–6.6 cm. wide, revolute, chartaceous-coriaceous, finally glabrous, concolored, more or less pinnately nerved, the 8–12 rather straight primary nerves moderately prominent both sides; racemes puberulent, 4–8 cm. long, 20–40-flowered, the common peduncles 1–2 cm. long, floriferous 1.2–3.5 mm. long, pedicels 8–13 mm. long; bracts sericeous, lanceolate or linear, sometimes curved at tip 2–4 mm. long, the bractlets ovate, 1 mm. long

or slightly longer, both persisting; flowers 15–17 mm. wide, the ovate sepals with obovoid glands; anthers linear-oblong, glabrous in type or, according to Niedenzu, somewhat sericeous, the cells and connective subequal; ovary glabrous; drupe globose, red, 7–12 mm. in diameter.—It seems probable that the Peruvian material placed here by Niedenzu belonged rather to *B. arthropoda*, which according to Grisebach in Mart. Fl. Bras. 12, pt. 1: 10. 1858 scarcely differs. F.M. Neg. 12883.

Loreto: Flood-free forest at mouth of the Santiago, (*Tessmann 4643*). Flooded forest at San Isidro, (*Tessmann 4947; 4947a*). Brazil. "Murici" (Tessmann).

Byrsonima Poeppigiana Juss. Ann. Sci. Nat. sér. 2. 13: 335. 1840; 714.

Allied to *B. arthropoda* but the leaves more or less puberulent on the nerves beneath where more prominent than above, the larger there puberulent-pilose; leaves 8–16 cm. long, 3.5–8.5 cm. wide, pale brown beneath and at least in the areoles puberulent; peduncles 2–3.5 cm. long, pedicels about 1 cm. long; bracts inclined to recurve, 3–5 mm. long, bractlets 1–3 mm. long; flowers 1.5–1.75 cm. wide; ovary sericeous; drupes pyramidate-ovoid, to about 6 mm. long.—Typically the indument is puberulent, the stipules are 4–6 mm. long, the anthers 1.5–2 mm. long; the var. *velutina* Niedenzu has denser pubescence, stipules 8–10 mm. long, anthers 2–3 mm. long. It seems probable that *B. brachystachia* DC. Prodr. 1: 581. 1824 (written *B. brachystachys* and *B. brachystachya* by Niedenzu), is an earlier name for this species, the description as amplified by Jussieu not disclosing any significant difference. The monographer observed that it is transitional to the genus *Alcoceratothrix* Ndz., since like that the leaves are areolate, stipules long; Sandwith, Kew Bull. 311. 1935, has by implication restored *A. stipulacea* (Juss.) Ndz. to *Byrsonima*. F.M. Neg. 24236 (var.).

Loreto: Flood-free high wood, Yarina Cocha, (*Tessmann 3450*, var.). Near Iquitos, (*Tessmann 5063*). Mishuyacu, *Klug 607; 692* (both det. Morton). Iquitos, *Williams 8076*. Bolivia; Brazil; British Guiana. "Chupicana."

Byrsonima sericea DC. Prodr. 1: 580. 1824; 701.

Shrub or small tree resembling *B. coriacea* but the leaves persistently more or less sericeous beneath; petioles slender, 1–8 mm. long; leaves more or less decurrent at the narrowed base; pedicels 5–8 mm.

long; bracts and bractlets subequal, sepals often eglandular.—*B. lancifolia* Juss., 703, of Brazil has leaves rather oblanceolate or somewhat obovate, ashy or metallic lustrous beneath, the bracts about twice as long as the bractlets.

The type, from Brazil, is probably, sens. lat., a part of *B. chrysophylla* and neither form, perhaps, is a stabilized entity.

Peru (fide notes but spec. not cited). Brazil; British Guiana.

Byrsonima stipulina Macbr., sp. nov.

Arbor 6 m. alta; ramulis ignotis; pilis bifurcis; stipulis bracteisque lanceolatis et late ovatis acutis 1.5 cm. et 1 cm. longis, dense rufo-strigosis; petiolis crassis 5 mm. longis; foliis ellipticis basin versus gradatim angustatis apice subabrupte breviterque acuminatis subcoriaceis supra nitidulis obscure puberulentis subtus minutissime puberulentis, nervis lateralibus (utrinque circa 17) supra paullo notatis subtus conspicuis, secondariis indistincte inter se parallelis; racemis 3 dm. longis fere ad basin floriferis, pedicellis 5 mm. sepalis vix 3 mm. longis ovato-rotundatis sericeis, glandulas circa 2 mm. longas; bracteolis suborbicularis 1 mm. longis intus glabratis; floribus circa 1 cm. diam.; petalis pallido-purpureis, 4 exteriorum limbo profunde cavo 5–6 mm., quinti reniformi irregulariter dentato circa 3 mm. longo; pili tori filamenta subequantes; connectivi appendicula obtusa loculos conspicue superante.

W. H. Wagner, Jr., graduate student, University of California, kindly dissected one of the two available flowers, preserving it in a slide which, with his sketches, is filed with the type and I record my appreciation of his careful work so generously contributed. The plant simulates *B. stipulacea* Juss., 762 (*Alcoceratothrix* Ndz.), in its subsessile leaves and conspicuous stipules (only one is on the tip of the flowering branch that constitutes the type). However, no trichomes have been found other than the subsessile, simply biforked ones characteristic of all species except *B. stipulacea*. Sandwith's suggestion, Kew Bull. 311. 1935, for the retention of the latter in *Byrsonima* seems to be correct in view of the discovery of this apparently intermediate species.

The rather recent death of the collector of this interesting plant is recorded with regret. Mr. G. Klug was an enthusiastic collector and able observer for many years near Iquitos; appropriately his name was given to a number of species discovered by him and, remarkably, in a region relatively well known.

Loreto: Mishuyacu near Iquitos, *Klug 1041* (type, U. S. Nat. Herb. with two sketches and slide prepared by W. H. Wagner, Jr.).

15. BURDACHIA [Mart.] Juss.

Trees with large chartaceous or coriaceous leaves, the flowers borne in (1–)3 racemes at the tips of the crowded branchlets. Bracts and bractlets short, broad and somewhat amplexicaul, each usually with a large orbicular gland. Petals 5, four with long slender strongly recurved claws and cochleate incurved blades, the fifth spreading, less recurved, the blade smaller, nearly plane and with stoutly stiped glands all around the margin. Stamens glabrous, the filaments dilated below where coalescent, the connectives enlarged. Styles 3, incurved before anthesis, apically uncinate, only one seed developing in the somewhat acute nut.—A similar Amazonian shrub or tree has been named *Glandonia macrocarpa* (Benth.) Griseb., 767, characterized by rigid linear caducous stipules, sericeous filaments, fifth petal glandular toward base, nut cylindric, apically umbilicate.

Burdachia prismatocarpa Mart. ex Juss. Arch. Mus. Paris 3: 311. 1843; 766.

Branchlet tips rusty sericeous but soon glabrate as the stout petioles, these 1–2 cm. long, and the coriaceous persisting intrapetioler stipules, these sometimes glabrate, 5–10 mm. long; leaves ovate or oval, rounded or obtuse at both ends, usually dull and nearly glabrous both sides or in one form regularly but sparsely pruinose-pulverulent beneath, always coriaceous and with the 6–10 or more lateral nerves often so prominent beneath that they are ribiform; peduncles 1–3 dm. long, the glabrate to sericeous racemes mostly in 3's and ordinarily about a dm. long; pedicels 6–13 mm. long with very broad-based acuminate bracts and bractlets; flowers rose-colored, over a cm. wide, 4 petals concave, the fifth plane and coarsely gland-margined; anthers 2–3 mm. long with broader obliquely oblong connective exceeding the cells by about 1 mm.; nut opaque, pyramidal or conoid, finally minutely trivalvate at tip, about 1 cm. long, nearly as broad at base.—A number of variations, particularly in shape of leaves, length of petioles (1–1.5 cm.) and even shape of nuts (as var. *sphaerocarpa* Ndz.), have been named. Illustrated, Pflanzenreich, l.c. pages 15 (fruit) and 764. F.M Neg. 12858.

Loreto: A 5 meter tree at Mishuyacu near Iquitos, *Klug 429*. Brazil.

VOCHYSIACEAE [St. Hil.] Mart.

Trees or shrubs, often large and somewhat turgid with resinous sap, often with opposite or verticillate branchlets and leaves, the latter shortly petioled, entire, coriaceous. Stipules none or small or reduced to glands. Flowers usually showy, irregular, hermaphrodite, racemose, paniculate or thyrsoid on articulate, usually bracted pedicels. Sepals 5, free or nearly, rarely adnate to the 1–3-celled ovary, the outer two ordinarily very small, the two anterior somewhat larger, the posterior usually much larger and spurred or gibbous at base. Petals 1, 3 or rarely 5, hypogynous or inserted at summit of calyx, clawed, obcordate, convolute in bud. Stamen inserted with the petal(s), mostly only one fertile, anther oblong, connective enlarged. Style simple, subulate, filiform or attenuate from base, stigma capitate, truncate or oblique, nearly or quite entire. Ovules axile, collateral or more or less biseriate. Fruits commonly capsular, 3-valved or samaroid, the seeds often winged, endosperm absent.

Petal 1; anther hastate-lanceolate, oblong-cordate or oblong.

Fruit samaroid; ovary 1-celled, biovuled; sepals adnate, persisting, excrescent.....1. *Erisma.*

Fruit capsular; ovary 3-celled, several-ovuled; sepals free.
2. *Qualea.*

Petals 1–3, rarely lacking; anther elongate; ovary 3-celled, ovules 2 per cell, pendulous; posterior sepal large, often spurred.
3. *Vochysia.*

1. ERISMA Rudge

Large trees with terete branchlets, opposite leaves, membranous stipules, sometimes persisting, and small or rather large violet reddish or yellow flowers disposed in axillary and terminal panicles, the pedicels (sometimes obsolete) bracted at base. Sepals adnate to ovary, persisting, excrescent, the two lateral and anterior smaller. Fertile stamen 1, staminodia 3–4 or none. Ovary 1-celled, included in sepals or free above, often villous within, style filiform, stigma capitate, ovules two at base of cell or affixed to short column. Fruit capsular, indehiscent, usually compressed and with a falcate reticulate coriaceous wing.

Spur nearly straight or somewhat incurved; fruits not winged in *E. calcaratum.*

Leaves 2–4 cm. wide; spur slender, straight; flowers orange; bracts small, caducous.....*E. Tessmannii.*

Leaves mostly or all wider; spur rather stout, somewhat curved.

Leaves usually rounded-cordulate at base; flowers blue; bracts small, caducous.....*E. calcaratum.*

Leaves acute at base; flowers lemon yellow; bracts large, persisting.....*E. bracteosum.*

Spur strongly curved; flowers blue; fruits winged.....*E. uncinatum.*

Erisma bracteosum Ducke, Bull. Mus. Paris, sér. 2. 4: 740. 1932; Archiv. Jard. Bot. Rio Jan. 6: 48. 1933.

Glabrous except the ashy tomentulose panicles; branchlets often exfoliating; petioles 5–10 mm. long or little longer, opposite, stout, sulcate; leaves mostly elliptic-oblong, acute at base, very shortly and obtusely acuminate and mucronulate or retuse, 8–16 cm. long, nearly 5 cm. wide, thin-coriaceous, little lustrous, glaucous above, pale or brunescent beneath, the midnerve and 8–10 laterals (these united before the margin) slightly impressed above, prominent beneath as, to a less extent, the reticulate venation; panicle terminal, yellowish white, often 5 cm. long, the flattened branches ashy tomentulose and adorned with persisting orbicular minutely stellate tomentulose bracts, subcordate at base, 8–13 mm. wide; flowers fragrant, shortly pedicelled, the smallest sepals 3–4 mm. long, next twice as long, the largest 10–12 mm. long, tomentulose without, mostly glabrous within but white-lanose marginally, the spur about 6 mm. long, somewhat incurved; petals lemon color with rufous spot, about 2 cm. long, obcordate, deeply emarginate, glabrous; anther and ovary glabrous, the style pilose below.—*E. laurifolium* (Spruce) Warm. in Mart. Fl. Bras. 13, pt. 2: 109, of northern Brazil has acuminate leaves with 12–15 lateral nerves, pilose ovary, glabrous(?), ex char., style. But the illustration, Warming, l.c. *pl. 20*, shows a pubescent style. This large tree has been collected, according to Ducke, at Tabatinga, Brazil, on the Peruvian boundary.

Peru (undoubtedly). Amazonian Brazil.

Erisma calcaratum (Link) Warm. in Mart. Fl. Bras. 13, pt. 2: 111. 1875. *Qualea calcarata* Link, Jahrb. Gewächsk. 1, pt. 3: 24. 1820. *E. violaceum* Mart. Nov. Gen. & Sp. 1: 137. *pl. 82.* 1826.

Glabrous except for the conspicuously cinereous often ample inflorescences, particularly their ultimate branchlets or (and) calyces,

the crowded minute trichomes stellulate; stipules ovate-subulate, to 3 mm. long, persisting at the annulately enlarged nodes, the petioles 3–4(–7) mm. long; leaves ovate or oblong-elliptic, usually obtuse or rounded, often slightly cordate at base, more or less abruptly shortly and obtusely but mucronulately acuminate, 1.5 dm. long, less than half as wide, or proportionately larger or smaller, coriaceous, lustrous at least above, the 6–12 arcuate lateral nerves finally rather prominent both sides and anastomosing before the margin; panicles with elongating compressed dark green (drying dark) and glabrous peduncles, contrasting with the attractive gray of the closely puberulent calyces, these about five together, subsessile (pedicels 2 mm. long), the lower lobes 7–10 mm. long, the lateral fifth acuminate; spur 3–5 mm. long, cylindric-conical; petals obovate-obcordate, blue-violet; anther connective acute; style glabrous, the stigma subcapitate.—Tree average size with abundant beautiful violet-blue flowers in the dry season or beginning of winter, in flooded woods (Ducke). The fruit, rather suggesting a pipe, according to Ducke, Arch. Jard. Bot. Rio Jan. 4: 107, is 4–6 cm. long, 2–3 cm. thick, ligneous, glabrous, with one seed 3–5 cm. long, 1.5–2 cm. thick, known as "jaboty" and collected for industrial oil; the soft coarse dirty white wood, however, is without value. Illustrated, Ducke, l.c. *pl. 13* (fruit).

Loreto: Mishuyacu near Iquitos, *Klug 1541*. Bolivia to Guiana.

Erisma Tessmannii Pilger, Notizbl. Bot. Gart. Berlin 11: 295. 1931.

Younger branchlets as the immature leaves beneath and the yellowish-brown sepals more or less stellulate-tomentulose; leaves oblong-elliptic, rounded at base, shortly and obtusely acuminate, 6–8.5 cm. long, 2.2–4 cm. wide, coriaceous, somewhat lustrous and pale above, brownish beneath, the midnerve there thick, the 8–10 laterals slender and arcuately joined toward the margin; panicle lax to about 12 cm. long; bracts narrowly ovate, 3 mm. long, caducous, the rotund bractlets 7 mm. long; outer sepal ovate or broader, 2–3 mm. long, the lanceolate inner 4–5 mm. long, excrescent, finally broader and to 5 cm. long, the other deciduous, subrotund-obovate, variously lobed, 4 mm. long; petals orange, obovate, to one-third lobed, very shortly unguiculate at base, the lobes rounded; filament stout, anther broadly lanceolate, obtuse, 2.5 mm. long.—Related to *E. floribunda* Rudge, different at least as to description (Pilger). F.M. Neg. 18230.

Loreto: Flood-free highwood, San Antonio above the mouth of the Río Santiago, *Tessmann 4932*, type.

Erisma uncinatum Warm. in Mart. Fl. Bras. 13, pt. 2: 110. 1875.

Superficially resembles *E. calcaratum* but with totally different fruit (Ducke); leaves acute or cuneately acute at base; stipules usually deciduous; spur strongly incurved; wing of the flattened fruit firm and reticulate-veined.—There is a form with verticillate leaves (Ducke); sometimes 50 meters high. Fruit wind-borne according to Ducke, Arch. Jard. Bot. Rio Jan. 4: 106, who thinks probably that the illustration of Baillon for *E. violaceum* Mart. (l.c., *E. calcaratum*) is rather the fruit of this species. F.M. Negs. 21955; 24308.

Peru (probably). Amazonian Brazil. "Quaruba" (Ducke).

2. QUALEA Aublet

Resiniferous trees similar to *Vochysia* but sepals quite free, petal always one, obovate or obcordate, fertile stamen one or two with sometimes 1–4 clavate staminodia, ovary free, stigma obliquely subcapitate, entire or obscurely 2-lobed, ovules several to many, biseriate on central angle. Flowers often tricolored, yellow, white and yellow, roseate or blue in lateral as well as terminal racemes or panicles, or sometimes binate mostly in the axils; petioles biglandular at base, opposite or verticillate.

Flowers mostly paniculate or inflorescence racemiform, few, solitary in the upper axils; anther not basally barbate, sometimes pilose in *Q. paraensis;* petals often tricolored.

Anther with broad, somewhat 2-lobed reflexed apical appendage; petals variously tricolored.

Inflorescence densely but shortly rusty pilose; anther appendage little lobed.....*Q. gracilior.*

Inflorescence merely puberulent; anther appendage bilobed. *Q. paraensis.*

Anther not so appendaged; petals not tricolored unless in *Q. calantha.*

Leaves oblong-lanceolate, 1–1.5(2) cm. wide; petals lilac. *Q. Tessmannii.*

Leaves elliptic, broader; petals yellow or yellow and white with roseate base.

Spur lacking; petals tricolored.....*Q. calantha.*

Spur present; petals white or yellow.

Branchlet bark exfoliating; leaves tomentose beneath; flowers white, 4–6 cm. long.....*Q. grandiflora.*

Branchlet bark persisting; leaves glabrous; flowers yellow, 3.5 cm. long.....*Q. impexa.*

Flowers mostly solitary or partly binate in leaf axils; anther barbate below; petals white with yellow-orange spot.....*Q. albiflora.*

Qualea albiflora Warm. in Mart. Fl. Bras. 13, pt. 2: 36. 1875. *Q. glaberrima* Ducke, Archiv. Jard. Bot. Rio Jan. 1: 46. 1915, fide Ducke.

Large tree, the ashy-colored bark of the stout trunk not at all exfoliating, that of the glabrous branchlets broken into small scales, the ferrugineous younger branchlets quadrate; petioles 5–7 mm. long; leaves opposite, glabrous, rather rigid-coriaceous, somewhat lustrous both sides, elliptic or oblong-lanceolate, acute at base, mostly shortly and subabruptly acuminate, often mucronate, 5–7(8) cm. long, 2.5–3(3.5) cm. wide, the midnerves yellowish-brown; flowers solitary in the axils of ultimate more or less leafless branchlets; pedicels 5–6 mm. long, sparsely pulverulent; sepals ashy sericeous within, fimbriate-margined, scarcely to 2 mm. long except the posterior, this 8–15 mm. long, longitudinally plicate, nearly carinate, the almost straight pendent spur 3–5 mm. long; petal varying in size, at most 4 cm. long, 3.5 cm. wide, mostly smaller, entire, white with yellow-orange spot; anther barbate below; ovary sericeous, style glabrous, involute at tip.—After Ducke. To 35 meters high in non-inundated forests; known from São Paulo de Olivenca and widely distributed. Illustrated, Ducke l.c. *pl. 19* (flowers). F.M. Neg. 32434.

Peru (probably). Amazonian Brazil.

Qualea calantha Pilger, Notizbl. Bot. Gart. Berlin 11: 297. 1931.

Glabrous except the minutely puberulent pedicels and also ciliolate sepals; leaves elliptic, rounded at base, obtusely rather long acuminate, 10–11 cm. long, 5 cm. wide, rigid-coriaceous, slightly lustrous above, brown and dull beneath where the numerous nerves and short veins are little prominent; panicle broad, moderately

dense, to 13 cm. long, the pedicels 7–10 mm. long; outer sepals rounded, coriaceous, 8–10 mm. long, the fourth similar but 13–14 mm. long, merely gibbous at base, not spurred; petal white, lemon color medially, basally roseate where curved, deeply bilobed, 5.5 cm. long; anther oblong, 8 mm. long, with short ovate tip; filaments 12 mm. long.—Well-marked by the lack of spur but related to *Q. Schomburgkiana* Warm. (Pilger). A 20 meter tree on forested cliffs 30 meters above the river. F.M. Neg. 18233.

Loreto: Pongo de Manseriche, *Tessmann 4855*, type.

Qualea gracilior Pilger, Notizbl. Bot. Gart. Berlin 11: 296. 1931. *Q. lancifolia* Ducke, Archiv. Inst. Biol. Veg. Rio Jan. 2: 53. 1935, fide Ducke.

Much like *Q. paraensis* but branchlets nigrescent and rather long-pilose with ashy trichomes; leaves fleshy, minutely pilose to glabrate above, pilose beneath, obtuse at base, long-acuminate, the tip itself obtuse or minutely apiculate, 7–11 cm. long, 20–32 mm. wide, not complicate, the numerous parallel nerves very prominent, especially beneath where also beautifully reticulate; panicle branches and pedicels more or less brownish-red villous or the sepals sericeous; flowers nearly inodorous, the white petals red and yellow spotted; anther dorsally ciliolate, appendage only slightly bilobed.—Type a 30 meter tree that in shape of leaves resembles only the Amazonian *Q. amoena* Ducke, Archiv. Jard. Bot. Rio Jan. 3: 197. 1922, but more pubescent. F.M. Neg. 18234.

Loreto: Mouth of the Río Santiago in flood-free woods, *Tessmann 4465*, type. Amazonian Brazil.

Qualea grandiflora Mart. Nov. Gen. & Sp. 1: 133. *pl. 79.* 1826.

Bark of branchlets exfoliating, usually pubescent; petioles 8–10 mm. long; leaves broadly oblong-elliptic, usually abruptly and acutely acuminate, 10–20 cm. long, 5–9 cm. wide, ashy tomentose beneath where the many rather prominent nerves anastomose nearly at margin; cincinni solitary or few-flowered in leaf-axils or disposed in a cylindric terminal inflorescence 1–1.5 dm. long; pedicels 1–1.5(2) cm. long; bracts 8–9 mm. long, appressed ashy sericeous as the calyces; buds ovoid, 1.5–2 cm. long; spur 2–2.5 cm. long, deflexed; petal white with yellow base or yellow, to 6 cm. long, 4 cm. wide; stamen glabrous; ovary pubescent; capsule on nodose pedicel, ligneous, 6–8 cm. long, the seeds, including the terminal wing,

scarcely 4 cm. long.—A little tree with yellow flowers, São Paulo de Olivenca to Paraguay (Ducke).

Peru (probably). Brazil to Bolivia and Paraguay.

Qualea impexa Macbr. Field Mus. Bot. 11: 67. 1931.

Glabrous except the more or less puberulent, but scarcely sericeous, pedicels and calyces; branchlets apparently not exfoliating; petioles slender, 1 cm. long; leaves elliptic, rounded at base, abruptly caudate-acuminate, the obtuse acumen to 8 mm. long, flexile-coriaceous, about 1 dm. long, 4.5 cm. wide, the nerves prominent especially beneath and reticulately joined at the strongly undulate margin; cincinni disposed in 1–few-flowered, densely paniculate racemes; buds ovate-conical, subequaling the 1.5 cm. long pedicels; keel dependent, elongate-obovoid, 7 mm. long, 3 mm. thick; petal broadly obcordate, to 3.5 cm. long, shortly clawed, glabrous; anther not at all barbate; ovary sericeous.—Type from a tree 24 meters high with yellow flowers so congested that they appeared to be snarled; perhaps resembles most *Q. macropetala* Spruce, ex Warm. in Mart. Fl. Bras. 13, pt. 2: 41, with flowers 5–6 cm. long.

Loreto: Mishuyacu near Iquitos, *Klug 748*, type.

Qualea paraensis Ducke, Archiv. Jard. Bot. Rio Jan. 1: 48. 1915.

Glabrous except the canescent sericeous flowers or sparsely puberulent pedicels; petioles opposite, 10–14 mm. long; leaves oblong or oval, 6–11 cm. long, 3–5 cm. wide, broadly acute at base, rather long-acuminate, more or less abruptly so, rigid-coriaceous, the transverse nerves prominent both sides; racemes terminal and upper-axillary, to 6 cm. long, the cincinni mostly 3-flowered; pedicels 5–8 mm. long; sepals all orbicular-oval, obtuse, the outer 12–18 mm. long, two or three times longer than other, with spur only 3–4 mm. long; petal white with a beautiful purple spot or band above the base, yellowish along the midnerve, emarginate, to 4 cm. long, 5 cm. wide; anther, in type, not bearded but dorsally slightly pilose; filaments and style glabrous; ovary pale-hirsute; anther broad, the two parallel cells separated by a broad connective, the sterile tip enlarged, 2-lobed and reflexed on the dorsal side of the anther which varies from glabrous to more or less bearded.—Similar is *Q. amoena* Ducke, l.c. 3: 197 (Pilger, Notizbl. Bot. Gart. Berlin 11: 296. 1931). The Tessmann collection was from a tree 30 meters high, branched at 15 meters. A great tree of virgin forest, frequent, Pará to the high Amazon, the petal tricolored and perfumed as in *Q. acuminata*

Spruce ex Warm. in Mart. Fl. Bras. 13, pt. 2: 40, but the red color more clear, leaves subsessile, anther glabrous; *Q. Schomburgkiana* Warm. has a short spur, anthers pilose (Ducke). Illustrated, Ducke, l.c. *pl. 16.*

Loreto: In flood-free woods, mouth of the Santiago, *Tessmann 4291* (det. Pilger). Brazil.

Qualea Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 9: 141. 1924.

Leafy branchlets minutely puberulent with some longer trichomes intermixed, the older glabrous and densely lenticellate; petioles often glandular at base, 2–3 mm. long; leaves mostly oblong-lanceolate, obtuse at base, apex often more or less obviously acuminate but the tip itself always obtuse, sometimes minutely emarginate, 4–6 cm. long, 8–18 mm., usually 12–16 mm. wide, somewhat lustrous above and glabrous except for the impressed midnerve, the many lateral nerves and the marginal one prominent, glabrous beneath except for some longer scattered trichomes and a puberulence, the reticulation evident but not prominent; leaves progressively smaller toward base of branchlets, the lowest obovate, 1.5 cm. long; inflorescence racemiform, 6–10 cm. long, cymules often 1-flowered; pedicels 3–5 mm. long; sepals appressed puberulent, minutely so within, the outer three gradually larger, 4–5 mm. long, 3 mm. wide, the fourth one cymbiform-plicate, 6 mm. long, the straight rigid spur about as long or longer, a little clavate and borne at an acute angle to blade; fifth petal 6 mm. long, 3.5 mm. wide, the upper margin strongly involute; showy petal cuneate-suborbicular, lilac, 11 mm. long, 12 mm. wide; filaments 5 mm. long, subequaling orange anther; ovary pubescent, style glabrous, stigma small.—Trunk of type tree 5 dm. in diameter. In small leaves and size of flowers seems nearest *Q. Dinizii* Ducke, Archiv. Jard. Bot. Rio Jan. 1: 49. *pls. 17* and *19E* (flowers). 1915, but the spur is straight (Mildbraed); apparently this is the only marked difference. Also very near *Q. parviflora* Mart. Fl. Bras. 13, pt. 2: 43, with glabrous or merely tomentulose leaves, 2–4(6)-flowered cymules, spur much curved. F.M. Neg. 12980.

San Martín: Juanjuí, *Klug 4275* (det. Standley).—Loreto: Flood-free woods, middle Ucayali, *Tessmann 3451*, type. Bolivia.

3. VOCHYSIA [Aublet] Poir.

Reference: Stafleu, Med. Bot. Mus. Rijks Univ. Utrecht 95: 398–540. 1948.

Glabrous or more or less pubescent or tomentulose, sometimes resinous with scattered, opposite or whorled, often beautifully veined leaves and usually showy fragrant yellow flowers borne in compound (rarely simple) elongate racemes or panicles ordinarily terminal, the pedicel bracts caducous. Stipules deciduous, subulate. Sepals connate at base, the posterior much the largest, often spurred. Petals usually 3, linear or spathulate, anterior mostly larger than the others. Fertile stamen with subulate or filiform filament at most half as long as the cucullate-tipped anther-connective; staminodia 2, subspathulate or none. Ovary superior, completely 3-celled, attenuate to style, stigma 1, rarely lobed. Capsules coriaceous or ligneous, dark with lustrous golden endocarp, ovoid or oblongoid, 3-celled, loculicidally 3-valved, 3-winged, each cell with 1 seed winged above by many long trichomes.—Name has been spelled *Vochisia*, *Vochya* and *Vochy*, this the native name used by Aublet; Stafleu, l.c. 400, has decided, apparently with good reason, that *Vochysia* is the form conserved.

My indebtedness to Stafleu's work is acknowledged, with especial appreciation for his intelligent approach and lucid presentation with inadequate material and information; see his general remarks, l.c. 401 et seq. When I have not entirely followed his taxonomy I have been prompted by the desire to simplify it if possible, in conformity with the scope of this floristic compilation.

According to Record and Hess, Timbers of the New World, 1943, a few species are promising for lumber but apparently the wood is usually inferior. Some Brazilian species yield a resin, like gum arabic, said to be of excellent quality; cf. Silveira, Arch. Mus. Rio Jan. 23: 164. 1921.

Lateral leaf-nerves nearly parallel and much more conspicuous beneath than veins; bark not exfoliating.

Leaves acuminate, more or less tomentulose or villous beneath, at least on the nerves.

Flower buds 1.5–4 cm. long; petals one or none (unknown in *V. majuscula*).

Petioles in 3's, 3(–8) mm. long; petals lacking. . . *V. Leguiana.*

Petioles opposite, well developed.

Flower buds 2–4 cm. long; petioles 3–4.5 cm. long. *V. eximia.*

Flower buds and petioles shorter. . . . . *V. majuscula.*

Flower buds about 1 cm. long or shorter; petals 3.

Petioles 5–8 mm. long; spur often recurved even to calyx. *V. ferruginea.*

Petioles 8–15 mm. long; spur moderately to scarcely curved.

Lateral nerves about 25; acumen 6–10 mm. long; spur nearly straight..... *V. densissima.*

Lateral nerves 8–15; acumen short; spur curved. *V. vismiaefolia.*

Leaves obtuse, or rounded, truncate or retuse and then sometimes merely apiculate.

Leaves opposite; petioles mostly 1–2 cm. long.

Leaves elliptic, to 12 cm. long, 3–4 cm. wide.. *V. vismiaefolia.*

Leaves obovate, often deeply emarginate, 5–9 cm. wide. *V. biloba.*

Leaves in 4's; petioles 4–8 mm. long.

Leaves broadly obovate, scarcely twice longer than wide. *V. Braceliniae.*

Leaves oblong-spathulate, three or four times longer than wide..... *V. lomatophylla.*

Lateral leaf-nerves inconspicuous even beneath, anastomosing or in any case obscure as the veins; bark exfoliating except *V. Sprucei.*

Leaves 15–18 mm. wide; bark not exfoliating..... *V. Sprucei.*

Leaves 2 cm. wide or wider; bark exfoliating.

Marginal leaf-nerve lacking or not defined; stigma not lobed except in *V. mapirensis.*

Ovary glabrous; inflorescence all axillary; young terminal leaves thin, evanescently gray-puberulent.. *V. citrifolia.*

Ovary more or less sericeous (rarely nearly glabrous); inflorescence at least in part terminal.

Spur recurved, that is, curving into the flower as well as bud; petioles about 1 cm. long.

Stigma terminal; style glabrous unless base; buds 1.5 mm. thick, the spur slender..... *V. obscura.*

Stigma lateral; style tomentose below; buds 2.5 mm. thick, the spur stout..... *V. Lehmannii.*

Spur incurved (toward pedicel) in flower (early recurved or spreading).

Style pubescent at base; stigma lateral, lobed; petioles 5–12 mm. long..... *V. mapirensis.*

Style glabrous or nearly; stigma terminal; petioles 2–4 cm. long.....*V. Haenkeana.*

Marginal leaf-nerve obvious but more or less undulate; stigma lateral, 2–3-lobed.

Ovary as inflorescence puberulent; style clavate...*V. diversa.*

Ovary glabrous as inflorescence or the latter glabrescent; style cylindrical.....*V. grandis.*

Vochysia biloba Ducke, Archiv. Inst. Biol. Veg. Rio Jan. 2: 52. 1935; 501.

Branchlets stout, acutely quadrate, not exfoliating, reddish-brown, obscurely puberulent as the stout 12–18 mm. long petioles; stipules small, ovate-acuminate; leaves opposite, obovate, rounded at the narrowed base, the 3–5 cm. wide apex often deeply (15–18 mm.) subbilobed-retuse (lobes rounded), commonly 14–17 cm. long, (5)7–nearly 10 cm. wide, the upper leaves always smaller, all rigid-coriaceous, yellowish glabrous and lustrous above, tomentulose beneath with a minute slightly lustrous copper-colored indument, the midnerve and 16–19 lateral nerves impressed above, prominent beneath, distinct to the premarginal nerve, the veins very finely reticulate; inflorescence cylindric, puberulent or glabrate, to 3 dm. long or longer, cincinni often 5-flowered; bracts small, ovate, acute, caducous; peduncles and pedicels 3–7, rarely exceeding 6 mm. long; flowers orange, anterior sepals minute, ciliolate, posterior glabrous at anthesis about 6 mm. long, spur 6–8 mm. long; petals villous dorsally (Stafleu); stamen shortly pilose, anther tip retuse; ovary glabrous, the somewhat apically enlarged style with lateral stigma nearly 1 mm. in diameter (Stafleu).—A large tree allied to *V. ferruginea* remarkable in the form of the leaves; frequent on terra firma about São Paulo de Olivenca, Brazil, and therefore to be expected within Peru. *V. retusa* Pilger, Notizbl. Bot. Gart. Berlin 14: 334. 1939, of eastern Ecuador, native name "chimbuya," has 4-verticillate leaves obtusely acuminate in sinuses, petioles only 5 mm. long, calyx spur straight.

Peru (probably). Brazil.

Vochysia Braceliniae Standl. Field Mus. Bot. 22: 149. 1940; 503.

Branchlets quadrate, nearly or quite glabrous, internodes elongate; petioles stout, scarcely more than 7 mm. long; leaves mostly quaternate, broadly oval-obovate, 8–17 cm. long, 5–10 cm. wide,

apically rounded or truncate and often abruptly apiculate with obtuse acumen to 7 mm. long, little narrowed to the obtuse or rounded base, coriaceous, opaque and glabrous above, the nerves more or less impressed, nearly concolor beneath, the younger sparsely sericeous especially on the nerves, finally obscurely puberulent or glabrous, with about 21(15–18) nearly straight lateral nerves riblike in age and united near margin into a collective nerve; flowers pale yellow in racemes to 16 cm. long, about 2 cm. wide that form a terminal panicle leafy at base, 18–20 cm. long, rachises puberulent to glabrous; cincinni mostly 2-flowered, peduncles 2–3, pedicels 2–5 mm. long; smaller sepals subrotund, ciliate; flower bud 6–9 mm. long, subclavate, straight or nearly as the cylindrical spur paralleling pedicel, 5 mm. long, 1 mm. thick; petals spathulate (central 1 cm. long), glabrous except apical margins; stamen pilose, staminodes villous at tip; style gradually enlarged toward lateral stigma, this with diameter of 0.8 mm. (after Stafleu).—A 12 meter tree with erect trunk, small rounded crown, the wood soft and useless (Mexia); named for Mrs. H. P. Bracelin, whose careful labeling and distribution of Mrs. Mexia's collections contributed toward their scientific value. Cf. *V. retusa* Pilger, Notizbl. Bot. Gart. Berlin 14: 334. 1939, the "chimbuya" of eastern Ecuador which Stafleu suggests may prove to be the same; however, ex char. (incomplete) its leaves are gradually narrowed toward base which is not at all the case for the Peruvian tree.

Loreto: In cut-over woods near Yurimaguas, trail to San Ramón, *Mexia 6081*, type. "Chambo caspi."

Vochysia citrifolia Poir. Encycl. Suppl. 5: 491. 1817; 450. *Cucullaria citrifolia* (Poir.) R. & S. Mantissa 1: 52. 1822.

Bark exfoliating, younger branchlets black, brownish-subsericeous, as the ovate acuminate stipules; petioles 1.5–2 cm. long; leaves opposite, the developing clustered terminal ones very thin, drying black, grayish puberulous, the adult coriaceous-papyraceous, glabrous except for some scattered trichomes beneath, elliptic or elliptic-oblong, obtuse at base, obtusely acuminate, mostly 8–10 cm. long, half as wide, inconspicuously reticulate with 6–9 lateral nerves, no marginal; inflorescence, so far as known, entirely axillary, cylindrical, dense, golden sericeous or tomentulose; cincinni mostly 1-flowered, peduncles and pedicels together 4–7 mm. long, the recurved subclavate or cylindric buds twice as long; spur strongly recurved often to the irregularly lobed calyx; petals about 3 mm.

long, slightly ciliate, one of the smaller sometimes lacking; stamen subclavate; style cylindric, the lateral stigma about 0.6 cm. long and broad.—F.M. Neg. 35049.

Río Acre: Near mouth of Río Macauhán, *Krukoff 5494*. Amazonian Brazil.

Vochysia densissima Pilger, Notizbl. Bot. Gart. Berlin 11: 298. 1931; 498. *V. vismiaefolia* Spruce var. *densissima* (Pilger) Stafleu, l.c. 498.

Branchlets soon glabrescent; petioles 1–1.5 cm. long; leaves oval, cuneately narrowed at base, rounded and narrowed to a short acumen at tip, 10 or 11 cm. long, 2.5–4 cm. wide, coriaceous, above paler and glabrous, drying olive-green beneath where densely puberulent-tomentulose, the 25 lateral ascending nerves obscure above, conspicuous as the reticulate veins beneath; panicle terminal or also from the upper axils, racemiform, narrow and very dense, 6 to 10 or 11 cm. long with very short 1–few-flowered branches, the rachis stout, reddish-tomentose; flowers small, yellowish, the coriaceous sepals rather orange tomentulose, the outer extremely small, the fourth finally strongly reflexed toward the spur (this nearly straight, 5 mm. long), plicate, elliptic, emarginate, 7 mm. long; petals 3, the larger elliptic, 4 mm. long, apically ciliate, smaller oval, 3 mm. long; stamens not seen; ovary glabrous, style 8 mm. long.—Allied by author to *V. vismiaefolia* Spruce, the type a 25 meter tree in flood-free wood. Stafleu may well be correct in regarding this as a variant of the tree of Spruce but until it can be collected again it seems as well, for this work, to retain it. Similar also is *V. boliviana* Rusby, 500, with twice as large leaves, rounded or subcordate at base and 15–20 major lateral nerves. F.M. Neg. 18231.

Loreto: Mouth of the Río Santiago, *Tessmann 4632*, type.

Vochysia diversa Macbr. Field Mus. Bot. 11: 67. 1931; 441.

Glabrous except the minutely and sparsely puberulent early exfoliating bark, stipules and brownish pilose inflorescence; branchlets terete, nearly black; petioles 5–10(15) mm. long; leaves verticillate, oblong-lanceolate or elliptic, attenuate to base, rounded at tip, sometimes minutely emarginate but not at all mucronulate, 8–12 cm. long, 2.5–3.5 cm. wide, coriaceous, slightly lustrous above, nearly opaque beneath, lateral nerves slender, little prominent either side, moderately reticulate; inflorescence narrowly cylindric-pyramidal, 1–1.5 dm. long, to 3 cm. broad, cincinni 1–2-flowered; bracts

nearly linear-subulate, to 7 mm. long; buds suberect, little clavate, about 8 mm. long; spur slightly clavate, recurved, 5–6 mm. long; petals subequal, obovate, rounded, ciliate; stamen and style glabrous, the latter clavate at tip, the lateral 3-lobed stigma 0.3 x 0.15 mm. (Stafleu).—A tree 20–40 meters high with yellow flowers apparently similar to *V. venulosa* Warm., 440, but that with petioles about 2 cm. long, and broader leaves that are lustrous both sides.

Loreto: Mishuyacu near Iquitos, *Klug 685*, type. Brazil.

Vochysia eximia Ducke, Archiv. Jard. Bot. Rio Jan. 1: 45. 1915; 519.

Entirely glabrous except the leaves beneath, petals and stamen; branchlets stout, the bark not at all exfoliating; petioles (3)3.5–4.5 cm. long, opposite; leaves rigid-coriaceous, often undulate-margined, lustrous and dark green above (drying pale yellow), unless in age intensely rufo-ferrugineous with short tomentum beneath, elliptic or oblong, acute at base or narrowed into the petiole, more or less gradually acuminate, the fragile acumen often extended for 2(–4) cm., mostly 18–37 cm. long, 5–9 cm. wide; lateral nerves prominent beneath, major and minor, but all ending in a submarginal nerve; veins widely reticulate; inflorescence terminal, elongate, the cincinni mostly 2-flowered; peduncles one, pedicels 1–2 cm. long, apically enlarged; flower bud 2–4 cm. long, spur 10–12 mm. long, paralleling pedicel; lateral petals lacking, central to one-third length of stamen, tomentulose as linear subacute basally subauriculate and barbate anther; staminodes if present glabrous as subclavate style, this with capitate orbicular terminal stigma with diameter 0.15 cm.; capsules 5–6 cm. long, 2–3 cm. thick, broad or larger, peduncle 3–5 cm. long.—After Stafleu, particularly the flowers. Notable for its large beautiful flowers and leaves (Ducke). Ranges into the western part of Solimoes according to Ducke and therefore in all probability extending into eastern Peru. F.M. Negs. 10519; 12911; 15678.

Peru (probably). Amazonian Brazil.

Vochysia ferruginea Mart. Nov. Gen. & Sp. 1: 151. *pl. 92.* 1826; 494. *Cucullaria ferruginea* (Mart.) Spreng. Syst. 4, pt. 2: 9. 1827.

A tree of medium size (Ducke), the branchlets, petioles (5–8 mm. long), leaves beneath, especially on the conspicuous lateral nerves, and elongate dense inflorescences densely and more or less persistently

ferrugineous tomentulose; leaves opposite, ovate, elliptic-oblong or lanceolate, abruptly contracted toward petiole, mucronately acuminate, 9–16 cm. long, about a third as wide, with a marginal nerve precisely at the slightly revolute edge; cincinni 1–5-flowered; peduncles and pedicels each 2–4 mm. long; flower buds straight or subrecurved, 6–10 mm. long, the strongly recurved spur apically enlarged; central petal as long as the obtuse 6–8 mm. long stamen, wider than the narrow laterals; style cylindric with lateral stigma about 0.5 mm. in diameter; capsules 2.5 cm. long, 8 mm. thick, obtuse.—Tree 6–30 meters with rusty yellow flowers.

San Martín: Tarapoto, *Ule 6431*. Zepelacio near Moyobamba, *Klug 3260*. To Central America and British Guiana.

Vochysia grandis Mart. Nov. Gen. & Sp. 1: 146. *pl. 88*. 1826; 453. *Cucullaria grandis* (Mart.) Spreng. Syst. 4, pt. 2: 9. 1827.

A large tree, only the upper leaves whorled (Ducke) and glabrous except for a few long soft trichomes on the young branchlets—these quadrangulate and line-ribbed from the deltoid 1 mm. long stipules—and in the dense inflorescence; petioles 2–4(or 1–1.5) cm. long; leaves elliptic or oblong or somewhat long-obovate, acute at base, apex rounded or obtuse and slightly retuse, 12–14(17) cm. long, usually 4–5(6) cm. wide, the reticulate venation and many lateral nerves prominent with a more or less undulate marginal nerve 1–2 mm. from the plane margin; cincinni 2–5-flowered, the peduncles 3–5 mm. long, pedicels progressively 3–7(12) mm. long, slender; flower bud straight, obtuse, about 8 mm. long, the recurved spur 7–10 mm. long; petals subequal, to half as long as obtuse stamen, its filament and anther subequal; style cylindric, the bilobed stigma lateral.—Variable in size as indicated. *V. ingens* Ducke, 448, "Cedro rana," has retusely acute leaves 7–9 cm. long, less than 3 cm. wide, acute flower buds, spur 5–6 mm. long, stigma terminal, orbicular, known yet as near Peru as upper Río Ica (tributaries). Large tree especially common at São Paulo de Olivenca, only the upper leaves verticillate (Ducke). Illustrated, Mart. l.c. F.M. Negs. 12920; 12919 (*Poeppig*); 24302 (var.).

Peru (probably). Amazonian Brazil.

Vochysia Haenkeana Mart. Nov. Gen. & Sp. 1: 147. *pl. 89*. 1826; 442. *Cucullaria Haenkeana* (Mart.) Spreng. Syst. 4, pt. 2: 9. 1827. *V. Haenkeana* Mart. vars. *Sprucei* Briq. and *microphylla* Briq. Ann. Cons. Jard. Bot. Genève 20: 386. 1919, fide Stafleu.

Glabrous except for the tomentose ovary, sometimes basally pubescent style, and slightly pilose calyx; petioles slender, 2–4 cm. long; leaves whorled, generally oblong-elliptic, varying toward lanceolate or ovate, retusely obtuse or subcuspidate-retuse; nerves as veins slightly prominent both sides; cincinni 1–3-flowered, the peduncles (including pedicels) slender; flower buds cylindric, straight or nearly, about 8 mm. long, the incurved spur as long or longer; petals glabrous, the central one shorter than or equaling the slightly pilose anther; stigma almost entirely terminal (Stafleu) with diameter of about 0.8 mm.—Small tree of sandy soils. Wood when cut exudes a viscid translucent resin (Williams). It seems that the variant in Peru with smaller elliptic leaves—about 7–10 cm. long, 3–5 cm. wide—and style pubescent at base is noteworthy as var. *Sprucei* Briquet, including however the var. *microphylla*. Illustrated, l.c. and in Mart. Fl. Bras. 13, pt. 2. *pl. 18*. F.M. Negs. 12921; 23026 (var. *Sprucei*); 24303 (var. *microphylla*).

San Martín: Tarapoto, *Williams 5425; 6155; 6491; Spruce 4078* (type, var. *Sprucei*); *Mathews 1650* (type, var. *microphylla*). To Bolivia and Central Brazil. "Killu-sisa," "goma-amarilla" (Williams).

Vochysia Leguiana Macbr. Field Mus. Bot. 8: 121. 1930; 523.

Large tree, the branchlets, leaves beneath, and inflorescence branchlets densely hirsute-villous with reddish trichomes; leaves apparently fasciculate, sessile or subsessile, oblong-obovate to elongate-elliptic, abruptly acuminate (rarely rounded), gradually narrowed to base, the larger 1.5 dm. long, 7 cm. wide, dull above and early minutely and sparsely strigillose, finally glabrous, underneath, especially on the nerves, densely red-pilose-hirsute, nerves above moderately impressed, beneath very prominent, veins reticulate; inflorescence cylindrical, dense, 1–1.5 dm. long; cincinni peduncled, only 1-flowered, the calyces lightly hirsutulous, 4 unequal but all broadly ovate, acute, spur slender, widely spreading or deflexed, and parallel to pedicel, about 5 mm. long; ovary densely hirsute; style cylindrical; stamen villous; staminodes glabrous.—Apparently distinctive as not at all tomentose. Flowers yellow. From the small branch of the type the bark is not exfoliate. Placed by Stafleu in his section *Pachyantha* consisting of three Amazonian species with bark retained, petals lacking, stamen villous: *V. pachyantha* Ducke and *V. Pinkusii* A. C. Sm.; both have petioled leaves, those of the former 2–3 dm. long, the spur inflated and incurved to

pedicel, the latter with leaves 10–13 cm. long, longer (12–18 mm.) petioles, the spur straight or S-shaped.

Commemorates the interest of a president of Peru in botanical exploration.

Junín: Chanchamayo Valley, *Carlos Schunke 434*, type. Brazil; Venezuela.

Vochysia Lehmannii Hieron. Bot. Jahrb. 20: Beibl. 49: 38. 1895; 442.

Glabrous or nearly except the pubescent inflorescence, the branchlets angled and striate by the decurrent leaves, more or less puberulent and exfoliating; petioles 1–1.5 cm. long, verticillate; leaves oblong, or slightly obovate, attenuate, acute or rounded to base, and mostly emarginate at tip, the larger 10–12 cm. long, 4–5 cm. wide, coriaceous, yellowish-green, lustrous above, paler and opaque with a few long trichomes beneath, younger reticulate both sides, lateral nerves of the older scarcely prominent, veins obscure; inflorescence cylindrical to 15 cm. long, 2–2.5 cm. thick, cymules 2–3-flowered; pedicels slender, 4–6 mm. long; sepals broadly ovate, ciliate, puberulent, subacute, the outer 1–2 mm. long, the posterior (fourth) ovate, 8–10 mm. long, 7 mm. wide, sparsely puberulent with deflexed recurved flexuous spur 4–7 mm. long; petals glabrous, rounded, nearly equal; stamen clavate, glabrous or slightly pubescent dorsally, anther 5 mm. long, filaments 2 mm. long; ovary fuscescent-pilose; style glabrous except tomentose base; stigma lateral, 0.1 x 0.1 mm.—So much Peruvian material has been referred to this species, which may yet be found, that it is included, and it may well occur since it grows in montaña forests between 300 and 1,100 meters, like the related *V. mapirensis*. A tree to 8 meters high with yellow flowers. F.M. Neg. 12922.

Peru (possibly). Colombia; Venezuela.

Vochysia lomatophylla Standl. Field Mus. Bot. 22: 150. 1940; 504.

In most respects, especially in the leaf-nervation, similar to *V. Braceliniae;* internodes short; petioles to 8 mm. long; leaves narrowly oblanceolate-oblong, 17–27 cm. long, 5–7 cm. wide near the tip, this often shortly narrowed and emarginate; leaf nerves about 25; racemes apparently solitary in the axils, 11–23 cm. long, the flowers mostly in shortly peduncled cymules, the glabrate pedicels to 8 mm. long; spur 8–9 mm. long, little more than 1 mm. thick;

central petal 11 mm. long; the lateral 6–7 mm. long; style nearly filiform, 12 mm. long, glabrous, the lateral stigma irregular, suborbicular with diameter of about 0.06 mm.—Cf. also *V. retusa* under *V. Braceliniae*. Tree 16–24 meters tall with yellow flowers.

Loreto: Río Mazán, *José Schunke 14*, type. Argelia, *Fox 76*. "Timareo de altura."

Vochysia majuscula Pilger, Notizbl. Bot. Gart. Berlin 11: 297. 1931; 521.

Branchlets as leaves beneath early reddish tomentulose, both glabrescent with age; petioles opposite, to 2 cm. long; leaves elliptic or oblong, cuneate to base, rounded and abruptly acuminate (acumen about 1 cm. long), paler and glabrous above, coriaceous, 12–14 cm. long, 4.5–5.5 cm. wide, with about 20 ascending lateral nerves more or less prominent only beneath; panicle laxly racemiform, 2 dm. long, the stout rachis with few branches or cincinni 1–2-flowered, the pedicels 5–10 mm. long; sepals glabrous, coriaceous, the outer small, rounded, one-fourth curved, somewhat erect, plicate, oval-lanceolate, to 2.5 cm. long, to 8 mm. broad, with stout incurved spur 8 or 9 mm. long; petal unknown; stamens 17 mm. long, the thick anthers with narrow cells and short conical tips; ovary glabrous, style 15(–20) mm. long with truncate stigma.—Related to *V. costata* Warm. (Pilger). Tree 25 meters high, flood-free woods, the flowers entirely yellow. F.M. Neg. 18232.

Loreto: Below the Pongo de Manseriche, *Tessmann 4797*, type.

Vochysia mapirensis Rusby, Mem. Torrey Club 6: 7. 1896; 444. *V. Weberbaueri* Beckm. Bot. Jahrb. 40: 279. 1908, fide Stafleu.

Glabrous, except the pubescent sepals, the exfoliate branchlets nigrescent; petioles (0.5)1–1.5 cm. long, whorled; leaves oblong-elliptic, narrowed into petiole, rounded or emarginate and apiculate, 8–16 cm. long, 2.5 cm. wide, lateral nerves 20–25, slender, little prominent, not joined into a submarginal nerve, dark green and lustrous above, olivaceous beneath; panicle conical, 18 cm. long, 2–3 cm. across below; cincinni 2–3-flowered, the peduncles 3–4 mm. long, pedicels 4–7 mm. long; flower bud 10–13 mm. long, subclavate; lateral sepals villous, subcordate, 1 mm. long, anterior oval about twice as long and as wide, the posterior ovate, 8–10 mm. long, 7 mm. wide, with incurved puberulent spur 5–9 mm. long; petals deep yellow, equal, glabrous, rounded or subapiculate at tip; stamen glabrous except for ciliate inner margin, dilated; filament 3.5 mm.

long; ovary pubescent; style slightly enlarged at pubescent base and glabrous tip, the lateral irregularly 2–3-lobed stigma about 0.2 by 0.1 cm. (Stafleu); capsules 3–4 cm. long, 1–1.5 cm. wide; seeds oblong, compressed.—Shrub or tree known to 15 meters with slender pale-barked trunk. There is a photograph, Weberbauer 276, that shows several trees. F.M. Neg. 12941 (type, *V. Weberbaueri*).

San Martín: Roja near Moyobamba, 800 meters, *Weberbauer 4704;* 290.—Junín: Colonia Perené, *Killip & Smith 25034* (det. Macbride, *V. Lehmannii* vel aff.). La Merced, on river cliff, *5552* (det. Macbride, *V. Lehmannii*).—Río Acre: (*Ule 9521*, fide Ducke). Bolivia.

Vochysia obscura Warm. in Mart. Fl. Bras. 13, pt. 2: 73. *pl. 13*. 1875; 436.

Branchlets quadrate from the line-ribs below the thick stipules; petioles about 1 cm. long, usually opposite; leaves elliptic or somewhat obovate, rounded or retuse and even broadly apiculate, 5–9 cm. long, 2.5–5 cm. wide, usually reticulate both sides and with a marginal nerve or two near the base; inflorescence nearly glabrous, the cincinni 1–2-flowered; flower buds cylindric, 1 cm. long, the slender strongly recurved spur nearly as long, emerging gradually from the fourth calyx-lobe, thus not making an acute angle with bud; petals glabrous, equal, elliptic; stamen glabrous, slightly clavate, curved; style glabrous (in type), subclavate with terminal orbicular stigma smaller than its tip; ovary subsericeous or sometimes nearly glabrous.—The Peruvian tree, 5–8 meters with golden yellow flowers, does not seem to be typical but so determined by Stafleu; its retuse leaves are at most 5 cm. long, 2.5–3 cm. wide, petals lightly pubescent as style toward base and may be a variant, worth designating as var. **Juliani** Macbr., var. nov., foliis ad 5 cm. longis; petalis paullo pilosis; stylo ad basin piloso; *Klug 4105*, type.

San Martín: Chazuta, 260 meters, *Klug 4105* (det. Standley, *V. Lehmannii*). Zepelacio near Moyobamba, *Klug 3641* (det. Standley, *V. Lehmannii*). To Brazil and Venezuela.

Vochysia Sprucei Warm. in Mart. Fl. Bras. 13, pt. 2: 99. 1875; 511.

A small tree distinctive among Peruvian species by its opposite crowded narrow leaves, these 5–6 cm. long, 15–18 mm. wide, rather oblong or somewhat lanceolate or oblanceolate, acute at base, obtuse, glabrous above (unless midnerve), puberulent tomentulose

beneath as the younger branchlets, petioles and terminal inflorescences; petioles 5–6 mm. long; lateral nerves obvious beneath, a marginal nerve more or less apparent; cincinni 1–3-flowered, peduncles 3–5, pedicels 5–8 mm. long; flower buds apiculate, about 1 cm. long; spur recurved, not enlarged at tip; central petal ovate, 3 mm. long; stamen marginally pilose, the anther broader above; style cylindric with small orbicular terminal stigma.—F.M. Neg. 12938.

San Martín: Near the top of the Cerro Pelado, Tarapoto, *Spruce 4566*, type.

Vochysia vismiaefolia Spruce ex Warm. in Mart. Fl. Bras. 13, pt. 2: 99. 1875; 497.

Becoming a large tree and more or less persistently rusty tomentose or slightly sericeous except the upper surface of the opposite leaves, these elliptic, acute both ends or the apex obtuse or shortly acuminate and obtuse-retuse, 8–12 cm. long, 3–4 cm. wide, the lateral nerves (typically 8–15) and marginal slightly prominent only beneath; inflorescences slender with 1–3-flowered cincinni, peduncles 3–4, pedicels 5–6 mm. long; flower buds recurved, 7–9 mm. long, the recurved spur 5–7 mm. long, somewhat enlarged apically; petals unequal, the central shorter than the pilose apically rounded stamen; staminodes marginally ciliate; style cylindric with small lateral stigma; capsules verruculose, 2.5 cm. long, wings subsulcate.—A northern Amazonian species to be expected; flowers at end of dry season (Ducke). See also *V. densissima* Pilger. F.M. Neg. 12939.

Peru (possibly). Brazil; Venezuela.

POLYGALACEAE Lindl.

Herbaceous or ligneous, sometimes scandent, with variously disposed leaves, the stipules glanduliform or lacking. Flowers perfect, often irregular, each usually with a bract and two bractlets. Sepals 5, partly or entirely free, or the two lower united, the inner two usually much larger and petaloid, as wings. Petals 3, rarely 5, free or united, hypogynous, the anterior boat-shaped, as keel, and often crested, the two upper frequently galeate, usually united below to the staminal sheath and often also to the keel. Stamens 8(or 3–7), the filaments ordinarily united into a split sheath; anthers with subterminal pores. Disk present, glanduliform or wanting. Carpels 1–2(or 3–5), united, the solitary style with single or bilobed

stigma, the usually solitary (sometimes 2–6) ovule pendulous. Fruit various.

Flowers irregular, more or less papilionaceous.

Ovary as usually the fruit 2-celled, the latter a dehiscent capsule, very rarely 1-celled by abortion.

Plants not scandent; capsules orbicular to triangular. 1. *Polygala.*

Plants or the branches scandent (if ever erect, probably young); capsules cuneate-obovate ..... 2. *Bredemeyera.*

Ovary and indehiscent fruit 1-celled.

Keel with a plicate crest; fruit a samara, the lower side winged; plants scandent ..... 3. *Securidaca.*

Keel not crested; fruit drupaceous or, if samaroid, biwinged; plants rarely if ever truly scandent ..... 4. *Monnina.*

Flowers tubular or salviform.

Leaves brittle, the venation obscure; calyx tubular, the base globose ..... 5. *Moutabea.*

Leaves flexible, veiny; calyx deeply divided, cylindric. 6. *Diclidanthera.*

1. POLYGALA [Tourn.] L.

References: Chodat, Monogr. pt. 2. 1893 (Mem. Soc. Phys. & Hist. Nat. Genève 23, pt. 2, no. 2. 1893); Blake, Contr. Gray. Herb. 47. 1916.

Herbs, shrubs or trees with usually alternate leaves (these, if verticillate, commonly the lower) and terminal axillary or infrequently extra-axillary racemes of small white or more or less deeply tinted flowers. Sepals 5, free or the two lower connate, deciduous or persistent, often three herbaceous or the lower two rarely petaloid the two inner usually so and, much larger, called "wings." Petals normally 3, united basally, lower carinate, sometimes 3-lobed, smooth or with an infra-apical beak or fimbriate crest, the two upper more or less united to staminal tube or keel; two lateral petals if present often minute. Stamens 8(6) united into tube split on upper side. Styles often long with two variously developed stigmas. Capsules about 2-celled, or completely, sometimes winged, less often fleshy-coriaceous, the cells, unless the lower, dehiscent. Seeds usually with highly varied aril, this rarely obsolete.—After Blake, who simplified the taxonomy, designating the following groups as sub-

genera. *P. deflorata* Chodat, unknown to me and not considered by Blake, but perhaps Mexican, is omitted from the key; apparently it belongs to Blake's subgenus *Hebeclada*.

Keel without crest or blade.
  Leaves densely reticulate-veined; capsules broadly winged. *Phlebotaenia.*
  Leaves and capsules otherwise.
    Sepals all free.
      Wings small, not more than a third length of sepals; capsules subcoriaceous, tardily dehiscent.....*Badiera.*
      Wings much larger than sepals; capsules not subcoriaceous. *Hebecarpa.*
    Sepals, the 2 lower, connate; wings and sepals persisting. *Hebeclada.*
Keel with entire crest.....*Chamaebuxus.*
Keel with 2–many-lobed crest.....*Orthopolygala.*

Flowers 2–4 mm. long in anthesis; slender-stemmed, clearly annual herbs.
  Leaves, unless the lower, regularly verticillate; keel fimbriate.
    Racemes floriferous nearly or quite to base; wings elliptic; petals short.
      Aril broad, shorter than seed; racemes lax, glabrous. *P. nemoralis.*
      Aril nearly as long as seed; racemes dense, pubescent. *P. peruviana.*
    Racemes more or less peduncled; petals long; aril half as long as seed.
      Aril broad; leaves in type shorter than internodes. *P. Pearcei.*
      Aril linear; leaves in type as long as internodes. . *P. Ruiziana.*
  Leaves alternate, unless the lower; keel crested except *P. translucida* and *P. brizoides.*
    Leaves linear-lanceolate or -oblong, usually several mm. wide; racemes elongate.
      Keel entire; leaves lanceolate, acute or acuminate.
        Wings obliquely obovate; stem pubescence incurved. *P. brizoides.*

Wings suborbicular; stem pubescence partly spreading. *P. translucida.*

Keel fimbriate-crested; leaves linear-spathulate, mucronate. *P. paniculata.*

Leaves linear-subulate or filiform, usually about 1 mm. wide or racemes capituliform; keel fimbriate.

Racemes capituliform..... *P. longicaulis, P. coridifolia.*

Racemes soon elongate.

Flowers shorter than 3 mm.; aril bilobed, minute.

Plants glabrous; aril about one-tenth as long as seed. *P. paludosa.*

Plants glabrous; aril about one-third as long as seed. *P. macerrima.*

Plants finely granular-glandular; aril at least one-fourth as long as seed..... *P. paniculata.*

Flowers 3–4 mm. long; aril as broad as seed. *P. Weberbaueri, P. Mathusiana.*

Flowers 5 mm. long or longer; stems firm or ligneous at least below; keel without a crest.

Leaves opposite; shrub or tree; flowers axillary.... *P. scleroxylon.*

Leaves alternate or verticillate.

Flowers 5–8 mm. long.

Sepals and wings more or less promptly caducous; leaves ovate, about half as wide as long.

Leaves long-acuminate; pedicels 2–3 mm. long; flowers 7–8 mm. long..... *P. platycarpa.*

Leaves acute; pedicels and flowers subequal... *P. andensis.*

Sepals or wings persisting; leaves often about a third as wide as long, usually ovate-lanceolate.

Flowers 5–7 mm. long; sepals connate.

Flowers about 5 mm. long; seeds oval or oblong.

Seeds oval with aril nearly as long; wings orbicular; leaves often acuminate..... *P. acuminata.*

Seeds oblong, twice as long as broad; wings oblique; leaves acute or obtuse..... *P. violacea.*

Flowers 6–7 mm. long; seeds subglobose. *P. macrostachya.*

Flowers 8 mm. long; sepals free..... *P. andina.*

Flowers 1–3.5 cm. long.
Leaves ovate-elliptic.
Bracts persisting, the rachis thus aculeate.
Flowers 10–12 mm. long; leaves small.....*P. anatina.*
Flowers larger; leaves large.....*P. gigantea.*
Bracts caducous.
Wings suborbicular.....*P. spectabilis.*
Wings ovate-acuminate.....*P. grandifolia.*
Leaves linear-lanceolate, much longer than wide..*P. formosa.*

Polygala acuminata Willd. Sp. Pl. 3: 887. 1803; 46.

Stems ligneous toward the base, erect as the sparsely branched branches and supra-axillary racemes, often several dm. tall, sometimes attaining more than a meter; petioles 2–3 mm. long; leaves lightly pubescent especially beneath, ovate-lanceolate, acuminate, 2.5–6(10) cm. long, usually 2–4 cm. wide; sepals obscurely glandular-ciliate, unequal, concave, the lower more or less to completely connate, finally divergent, apiculate; wings suborbicular, glabrous, few-nerved, not at all or scarcely inequilateral, much longer than the keel; upper petals dilated toward the truncate or retuse tip, not at all contracted medially nor cuneate at base, equaling the cucullate ciliate keel; ovary glabrous; capsule elliptic, little longer than broad; seeds pubescent, less than twice as long as the large rounded entire aril.—Flowers white or slightly pinkish-purple, or early pale rose then greenish-white, a meter high (Weberbauer). Determinations by Chodat except as noted. Illustrated, Chodat, *pl. 15, figs. 11–13* (flower and seed).

Huánuco: Pozuzo, *4632.* Churubamba, trailside tangle, 1,135 meters, *Mexia 8157* (det. Blake). Río Chinchao, forest edge, 1,200 meters, *Stork & Horton 9576* (det. Standley); *9423.*—San Martín: Tarapoto, *Williams 5803; 5412.* Zepelacio, *Klug 3467* (det. Standley). Pongo de Cainarachi, *Klug 2676* (det. Standley).—Junín: La Merced, 700 meters, *Weberbauer 1829; Killip & Smith 23431; 23408.* Río Perené, *Killip & Smith 24910; 25417; 25319.* Chanchamayo Valley, *Schunke 371.*—Ayacucho: Aína, *Killip & Smith 22731.* Forest edge near Kimitiriki, *Killip & Smith 22848* (det. Killip).—Loreto: Yurimaguas, *Killip & Smith 27587; Williams 4382; 4115; 4453; 7869; 4781.* Locality not noted, *Poeppig 1323,* type. "Puru-pagic-sacha" (Williams).

Polygala anatina Chodat, Bot. Jahrb. 42: 98. 1908.

A meter shrub, the younger parts scarcely puberulent; stipules to 1 mm. long, not at all coriaceous; leaves elliptic, emarginate or acutish, glabrous, 3.8–4 cm. long, 16–18 mm. wide; racemes terminally comose, rather short, the axis puberulent; pedicels 5–6 mm. long; flowers 11–12 mm. long; sepals large, glabrous; wings broadly ovate; petals purple, narrow, retuse, shorter than the cucullate keel; ovary obcordate, the disk annulate, the long curved style enlarged to a seahorse-shaped stigma, the short upper one acute, lower obtuse, longer than wings; seed shortly and densely hirsute, dorsal aril two-thirds as long.—Section *Ligustrina*, sepals and wings persisting but seeds estrophiolate. F.M. Neg. 12997.

Puno: Sandía to Tambo Azalaya in June, 1,500 meters, *Weberbauer 1072*, type.

Polygala andensis Chodat, Monogr. pt. 2: 25. 1893.

Shrubby; branches 1–1.5 dm. long, erect, puberulent; petioles very short; leaves ovate-lanceolate to elliptic, cuneate at base, acute at apex, pubescent, about 4 cm. long, half as wide; flowers many, crowded, subequaling the pedicels; outer sepals lanceolate, acute, herbaceous, ciliate; wings elliptic-orbicular, eciliate with few-branched nerves, not at all exceeding keel; upper petals orbicular at tip, much shorter than keel; ovary elliptic, pilose, much longer style vaginiform apically, the upper narrow papillose stigma twice as long as the glanduliform lower.—Chodat contrasts this in his key with the Mexican *P. rivinaefolia* HBK. by its "acute" instead of "cuspidate" leaves (not a clear or impressive difference!); and his type is probably from Mexico; my remarks under *P. deflorata* apply equally here. Illustrated, Chodat, *pl. 14, figs. 7–9*. F.M. Neg. 34942.

Peru(?): *Pavón*, type, herb. Boissier and Paris.

Polygala andina Bennett, Bull. Torrey Club 16: 19. 1889.

Ascending, pubescent, with thin subglabrous apical short-petioled leaves, terminal racemes of pedicellate flowers, the pedicels hirsute; outer sepals unequal, ovate, pubescent, the ciliate larger, upper concave; wings large, ovate, glabrous and eciliate, 8 mm. long, 6 mm. wide; corolla as long, keel strongly gibbous at base, petals two-thirds coalescent, the upper rotund; seeds and fruit unknown.—According to the author, near *P. Laureola* St. Hil. of Brazil, less pubescent and with smaller flowers (6–8 mm. long on pedicels as long); the subconic seed with linear dependent aril as long marks

the species of St. Hilaire. Bennett's species was apparently overlooked by Chodat, as he includes *P. formosa* from the same reference; since the type was from La Paz, the species may be expected within southern Peru.

Peru (probably). Bolivia.

Polygala brizoides St. Hil. Fl. Bras. 2: 44. *pl. 88.* 1829; 52. *P. angustifolia* HBK. Nov. Gen. & Sp. 5: 405. *pl. 511.* 1823, not Gilib. 1781. *P. camporum* Benth. in Hook. Journ. Bot. 4: 100. 1842, fide Chodat.

Slender-stemmed annual, often with a few puberulent or strigillose branches and sometimes attaining several dm.; leaves linear-lanceolate, attenuate each end, subglabrous or sparsely pubescent; racemes supra-axillary, usually 5 cm. long or longer, the pinkish-purple flowers about 4 mm. long on slender pendulous pedicels; sepals green, oblong-ovate, obtuse, glandular-ciliate; wings broadly cuneate-obovate, glabrous, shorter than or about equaling the keel; capsule oblong-elliptic, about 3 mm. long, 1.7 mm. wide; seeds 2.5 mm. long, aril 0.7 mm. long (Blake).—The Mathews specimen was referred by Chodat to var. *latifolia* St. Hil., leaves broader, stems more hirsute-villous, and perhaps should not be included in the species, the range of which, according to Blake (who wrote *P. bryzoides*), scarcely encompasses the Andean areas. Illustrated, Chodat, l.c. *pl. 15;* Blake, Contr. Gray Herb. 47: *pl. 2, fig. 45* (seed). F.M. Neg. 34985.

Peru: (*Mathews*, fide Chodat). Sinaloa; Cuba to Colombia and Brazil.

Polygala coridifolia Presl, Rel. Haenk. 2: 99. 1835; 296.

Glabrous stems many, ascending, simple, leafy to ligneous base; leaves crowded, sessile, linear, revolute, mucronate, 6–12 mm. long, less than 0.5 mm. wide; racemes capituliform; pedicels 2 mm. long; bracts scarious; flowers 2 mm. long; petals shorter than the obovate acute wings, these twice as long as the subemarginate capsule; keel crested, curved, apically bilobed; seeds oval-globose, white-villous with subulate furcate aril as long.—Like *P. corisioides* St. Hil., according to the author.

Huánuco: In the mountains, (*Haenke*, type). "Chinchinia."

Polygala deflorata Chodat, Monogr. pt. 2: 23. 1893.

Stems ligneous, green, branching, ascending, terete, lightly striate, puberulent; leaves shortly petioled, ovate, acute, spreading

or deflexed, 4 cm. long, half as wide, velvety pubescent; racemes axillary, few-flowered, short; capsules suborbicular, subcordate, broader than long (6 mm. wide, 5.5 mm. long), pubescent; seeds oblong, bell-shaped, attenuate apically, aril capituliform, marginally papyraceous.—Species very distinct (Chodat, who while omitting it from his key, places it in text next to *P. rivinaefolia* HBK. of Mexico, a species belonging to subgenus *Hebecarpa* (Chodat) Blake, characterized by sepals all free, wings much larger than sepals, capsules not subcordate!). Since so much of the material labeled "Pavón" in herb. Boissier is really Mexican in origin, probably Sessé and Mociño, there is no certainty that this plant is Peruvian and it should have been considered by Blake.

Peru(?): (*Pavón* in herb. Boissier, Geneva, type).

Polygala formosa Bennett, Bull. Torrey Club 16: 19. 1889; 82.

Shrub with glabrous or puberulent erect stems and branches and linear-lanceolate acuminate leaves 7–10 cm. long, 12–22 mm. wide, shortly petioled; racemes terminal or axillary, lax, 2–5 cm. long or longer; pedicels puberulent, 6–10 mm. long; outer sepals unequal, glabrous, ciliate (Chodat), the upper convex; wings large, glabrous, eciliate, unequal, oval, 12 mm. long, 8 mm. wide; corolla ecristate; petals much longer than the wings, glabrous; capsule elliptic, emarginate; seeds triangular, hirsute, aril fleshy, half free, descending.—Affine *P. spectabilis* DC. with broader cuspidate leaves; the narrow leaves suggest the Brazilian *P. oxyphylla* DC., 77, which, according to both Bennett and Chodat, should include *P. Laureola* St. Hil.; see under *P. andina*. Since type is from Mapiri, the shrub is within the range of many Peruvian species.

Peru (possibly). Bolivia.

Polygala gigantea Chodat, Monogr. pt. 2: 75. 1893.

Stems stout to 3 cm. thick, not striate, ligneous, erect or curved; leaves shortly petioled, oblong, cuspidate, 2 dm. long, 6 cm. wide, very thin, glabrous; racemes early much congested, terminal, to about 1 dm. long, densely flowered, the rachis aculeate after flowers fall by the persisting glandular bractlets, the subulate ciliate bracts about 7 mm. long; sepals unequal, the upper sacculiform, petaloid, ciliate, the lower ovate, the other larger, obliquely orbicular; wings ciliate, three times larger, involute, equaling or shorter than corolla; upper petal ligulate, obtuse, shorter than keel, this with limb shorter than claw; filaments pilose (always?); ovary elliptic; stigmas un-

equal, the upper dentiform, the lower rotund, at least early papillose.—Imperfectly known, perhaps not from Peru, but apparently the following specimens are referable to it rather than to the related Brazilian species *P. Laureola* St. Hil. and *P. grandifolia* St. Hil. with similar foliage; the rachis of the former is nearly smooth, the seed equaled by a linear reflexed aril while the latter has ciliate wings and seeds with an elliptic, much shorter aril. It also resembles the widely distributed *P. spectabilis* DC., 79, with firmer ciliate-margined leaves, corolla 2–2.5 cm. long, seeds nearly like those of *P. grandifolia*. F.M. Neg. 24336.

Huánuco: Deep forest, Tingo María, flowers yellowish, turning rose, leaves yellow-green with deep red veins, *Stork & Horton 9561* (det. Standley).—Junín: Puerto Bermudez, flowers yellowish, wings greenish-white, *Killip & Smith 26495* (det. Chodat).—Río Acre: Seringal San Francisco, *Ule 9522* (det. Dahlem, *P. grandifolia*). Without locality, *Pavón*, type. Brazil.

Polygala grandifolia St. Hil. Fl. Bras. 2: 52. 1829; 74.

A small shrub with terete striate stems, very short conical aculeate stipules and thin oblong-elliptic shortly acuminate leaves 12–20 cm. long, half as wide, glabrous except for the puberulent pedicels (these about 5 mm. long), the unequal ciliate outer sepals and obovate-triangular obtuse wings, these 17 mm. long, or persisting and in fruit 2 cm. long; leaves often alternate, acute or shortly acuminate, 1–2 dm. long, 6 or 7 cm. wide; racemes terminal, axillary or supra-axillary, often hidden among the upper leaves, few-flowered, 6–9 cm. long, the flesh-colored glabrous flowers 14–18 mm. long; upper petals largely connate with staminal tube, not at all dilated at tip, little exceeding keel, this cucullate, trilobed, plicate and longer than the oblong-elliptic acuminate wings; dilated filaments broader than long; capsules wing-emarginate; seeds 8 mm. long, half as wide, tuberculate, hirtellous with 4 short basal teeth, bidentate at tip.—Illustrated, Chodat, l.c. *pl. 16* (flower); Mart. Fl. Bras. 13, pt. 3: *pls. 3* and *30* (seed).

Peru (possibly). Brazil.

Polygala longicaulis HBK. Nov. Gen. & Sp. 5: 396. 1823; 182.

Slender, erect, usually somewhat branched annual, often several dm. tall, glabrous or slightly stipitate-glandular below, the leaves alternate unless for one whorl near the base, linear- to oblong-lanceolate, 5–12(20) mm. long, 1–3 mm. wide, acuminate, cuspidate;

peduncles usually naked, the subcapitate racemes only about a cm. long or shorter; pedicels 2–2.5 mm. long; flowers deep purple or pale (white or yellowish); sepals broad, very cuspidate, 1.8–2.3 mm. long, the elliptic acuminate wings 4.5–5 mm. long, nearly half as wide, cuneate-rounded at base, conspicuously 3-nerved; keel 4.7 mm. long; capsule ovate-oblong, 3 mm. long, 1.3 mm. wide; seed obconic, sericeous, with apical coma 2.5 mm. long, the bilobed aril 0.3 mm. long (after Blake).—*P. variabilis* HBK., 180, conic-capitate smaller flowers, the wings rounded or submucronulate; *P. glochidiata* HBK., 164, several whorls of leaves below, densely glandular, flowers about 2.5 mm. long in cylindric racemes, seed with uncinate trichomes, aril obsolete. All these species, rather widely distributed into South America from the northern areas, could occur.—Illustrated, Chodat, *pl. 21, fig. 41* (not *pl. 22*, as cited), seed and flower parts. F.M. Neg. 34966.

Peru (probably). Mexico and the West Indies to South America.

Polygala macerrima Blake, Proc. Biol. Soc. Wash. 43: 5. 1930.

Completely glabrous erect annual or with several erect branches, the alternate linear leaves, or the upper linear-subulate, mostly deciduous at anthesis, the lower 10–18 mm. long, acuminate, 1-nerved; peduncles terminal, 1 cm. long or shorter, the slender cylindrical racemes acute, 2.5–8 (axis to 26) cm. long, 4–6.5 mm. thick, dense or rather lax, the erose-denticulate bracts deciduous; pedicels 0.8–1.2 mm. long, widely spreading or deflexed in fruit; flowers rose-purple or violet-pink, upper sepal oval, 1.2 mm. long, erose, 1-nerved, lower narrower; wings elliptic-obovate, 2–2.2 mm. long, 3 mm. wide; upper petal obliquely oblong-ovate, about 5-nerved, 2.2–2.5 mm. long, keel 2.5–2.8 mm. long, crest deeply multifid; capsule equaling or somewhat longer than the wings, oval, about 1.8 mm. long; seeds pilose, oblong-ellipsoid, obtuse each end, 1.5–1.7 mm. long, the bilobed aril about a third as long.—Similar to *P. gracilis* HBK. (Colombia and Venezuela to Mexico) with raceme axis finely pubescent, pedicels erect or suberect, capsules noticeably shorter than the wings (Blake).

Peru (probably). Colombia; Bolivia.

Polygala macrostachya Chodat, Bull. Herb. Boiss. 4: 234. 1896.

Leaves lanceolate, subobtuse, 9 cm. long, 3.4 cm. wide, about equaled by the flowering racemes, these rather lax and finally much

elongating; flowers 6–7 mm. long; seeds densely hirsute, aril broad, not at all lucid.—Said by author to be allied to his *P. Lindeni*, 44, of section *Hebeclada*.

Peru(?): (*Pavón*, type in British Museum).

Polygala Mathusiana Chodat, Monogr. pt. 2: 231. 1893.

Stems simple at the terete subligneous base, erect, branched only above, somewhat tuberculate from bases of fallen leaves, glabrous, to 3 dm. high; branches many, erect, terminating in racemes 1–2 dm. long; lower leaves sometimes verticillate but often all alternate, numerous, linear, 4–8 mm. long, 0.5–0.8 mm. wide, rather thick, glabrous, acute, those toward raceme shorter but cuspidate; flowering portion of racemes 2–3 cm. long; bracts deciduous; pedicels about 0.5 mm. long, glabrous; flowers 3–3.5 mm. long, roseate; outer sepals unequal, the upper broadly ovate, the lower lanceolate ones half as wide; wings narrowly elliptic, attenuate both ends, equaling the long beautifully cristate keel; anthers subsessile on the tube; the upper petal one-half connate, long-attenuate; style not longer than ovary; upper stigma crests not at all stiped; capsule oblong, 3 mm. long, 1.2 mm. wide, acute both ends, minutely tuberculate, equaling wings; seeds oblong, appressed pilose, dorsal face a little curved; caruncle obsolete, the appendage three times shorter than seed, little longer than broad.—*P. boliviensis* Bennett, 176, has longer leaves, nearly linear capsules, long-conic acute seeds, small bilobed aril, trichomes short, rigid.

Cajamarca: Between valleys of Tabaconas and Marañón, *Weberbauer 6177* (det. Chodat).—Amazonas: Chachapoyas, *Matthews*, type (herb. Delessert).

Polygala nemoralis Bennett, Journ. Bot. 17: 172. 1879; 143.

Entirely glabrous herb unless for the early puberulent terete stems, these soon glabrescent with strict branches, leaves verticillate or most of them, subsessile, ovate-lanceolate, acute, about 4 cm. long, 8 mm. wide, pale beneath, only the central nerve prominent; racemes terminal, subsessile, about 5 cm. long, the bracts caducous; flowers rose-colored, 3 mm. long or longer; sepals unequal, the outer much narrower than the elliptic 3-nerved upper, the wings elliptic, rounded apically, little longer than the corolla; middle nerve simple, lateral nerves once branched, 4 mm. long; upper petals very unequal, obliquely rounded, not rhomboid, twice longer than broad; keel crest much laciniate; anthers subsessile; ovary glabrous, upper stigma

vaginiform, prolonged into an erect cristate appendage; capsules elliptic, subequaling wings, with oblong subfalcate sparsely pilose seeds with wide white aril three-fourths as long.—After Chodat, who limited the species to the Bolivian type, *Mandon 839;* Blake accepted this, referring the other specimens included by Bennett to the northern *P. aparinoides* H. & A. The Peruvian specimens have narrower leaves, longer in the Weberbauer, shorter in mine. Illustrated (flowers and seed), Chodat, *pl. 20.*

Cajamarca: Above Tabaconas, *Weberbauer 6274.*—Huánuco: Huacachi near Muña, *3893* (det. Chodat, "spec. nov.," ined.). Bolivia.

Polygala paludosa St. Hil. Fl. Bras. 2: 8. 1829; 226; Blake, 97. *P. leptocaulis* T. & G. Fl. N. Amer. 1: 130. 1838, fide Blake. *P. alopecurus* Chodat, Monogr. pt. 2: 227. *pl. 24, figs. 6–7.* 1893?

Glabrous; stems erect, slender, 2–6 dm. high, simple, or above with a few very slender elongate branches terminating in racemes 2–9 cm. long or longer, the nearly filiform pedicels (–1 mm. long) finally recurving; leaves linear-aciculate, 5–25 mm. long; flowers often roseate, 1.5–2 mm. long, the subequal outer sepals ovate-lanceolate, wings elliptic, 3-nerved or nearly 1-nerved, little longer than the crested keel (2 mm. long); upper petal lanceolate, subretuse; anthers subsessile on the tube; capsule oblong-elliptic, with a row of glands each side of septum, subequaling wings; seeds oblong-elliptic; aril minute, bilobed, appressed, obtuse both ends, slightly puberulent, 1.2 mm. long (Blake).—Svenson, Amer. Journ. Bot. 33: 458. 1946, has noted that Chodat's illustration of the seed of *P. alopecurus* matches that which he shows for the species of St. Hilaire, both with aril only one-tenth length of seed, the author's key character for his species, "aril one-half length of seed" evidently an error. Since Svenson found seeds 1.5 mm. long in specimen from Colombia (det. Blake, *P. leptocaulis*) and seeds averaging 1.1 mm. long in *P. alopecurus*, from general type region (Chanduy), it is probable, as he states, that the latter is no more than a small-seeded variation of *P. leptocaulis* which in turn seems not clearly separable from the Brazilian plant. According to Wm. Hunter (cf. Svenson) this "purple flowered grass" appears only in occasional years. Illustrated, Chodat, l.c. *figs. 4, 5.*

Piura: La Libertad, (*Svenson 11192*). Salinas, (*Svenson 11206; 11399*). Ecuador; Brazil; North America?

Polygala paniculata L. Amoen. Acad. 5: 402. 1759; 229; Blake, 99.

Annual, paniculately branched above from a slender perpendicular root, the lower simple part of the stem sometimes subligneous, glabrate, the slender erect densely leafy branches terminating in spiciform laxly-flowered racemes 3–6 cm. long; leaves (as stems) alternate unless below, linear or lanceolate-linear, acute both ends, 8–18 mm. long, 0.5–2.5 mm. wide, more or less minutely glandular; flowers about 2.5 mm. long, finally pendulous, the slender rachis becoming sparsely tuberculate; bracts narrow, deciduous; outer sepals subpetaloid, the upper broadly ovate, biglandular at base, the anterior narrowly elliptic as the twice as long wings; wings barely twice longer than broad, equaling or little exceeding the filamentose-crested keel, this 2–2.5 mm. long, with which the upper narrowly lanceolate acuminate petal is one-third connate; stamens glabrous, the anthers shorter than the filaments; capsule elliptic, little if at all longer than the persisting wings; seeds 1.5 mm. long, oblong, hirsute, with two scarious aril lobes 0.4–0.8 mm. long.—Petals pinkish-blue (Killip & Smith), or white or tinted. Determinations except as noted by Standley. Illustrated, Mart. Fl. Bras. 13, pt. 3: *pl. 11.*

Huánuco: Mito, grassy slope, *3267* (det. Blake). Tingo María, *Soukup 2266.* María del Valle, *3554* (det. Blake).—San Martín: Juanjuí, *Klug 4319.* Zepelacio, *Klug 3286.* San Roque, *Williams 7138; 7452; 7686.*—Junín: La Merced, shaded bank, 700 meters, *Killip & Smith 23678* (det. Killip).—Ayacucho: Aína, *Killip & Smith 22567.*—Cuzco: On recent landslide, *Cook & Gilbert 1497;* at 950 meters, *Bües.*—Loreto: Fortaleza, *Klug 2830.* Balsapuerto, *Klug 2860.* To Mexico, Brazil and the West Indies.

Polygala peruviana Bennett, Journ. Bot. 17: 173. 1879; 146.

Stems ascending, terete, 3 dm. long or longer, simple and glabrous below; leaves linear-lanceolate, attenuate both ends, acute, 2.5 cm. long, 5 mm. wide, glabrous, midnerve prominent, lower verticillate; racemes terminal, 3–5 cm. long; bracts deciduous; flowers 3 mm. long, the pubescent pedicels short; outer sepals linear-lanceolate, subpubescent, ciliate, two lower approximate; wings narrowly elliptic, twice as long as the outer sepals; capsules suborbicular, emarginate, equaling the wings; seeds curved, pilose, equaled by their 2 arils.—Near *P. nemoralis* Bennett but with much smaller narrower leaves, lower stem often naked, pedicels longer, entire plant somewhat more pubescent (Bennett).

Junín: Oxapampa, *Soukup 2418* (det. Killip).—Puno: Among mosses, Tatanara, (*Lechler 2629*, type, herb. Kew).

Polygala Pearcei Bennett, Journ. Bot. 17: 201. 1879; 152.

Glabrous angulate ascending stems 3–4.5 dm. high, the distantly 4–5-verticillate leaves 12 mm. long, 3–4 mm. wide, lanceolate, thick, rugose, revolute, sparse above; racemes peduncled, 2.5–5 cm. long, the roseate 3 mm. long flowers on short slender pedicels with lanceolate acuminate deciduous bracts; outer sepals subequal, ovate, half longer than the wings, exceeding the corolla; keel-crests with long, slender fimbriae; lateral petals divided nearly to base, sublonger than keel; style curved, much dilated medially or also winged; capsule elliptic, emarginate; seeds brown-sericeous, the two broad membranous appendages half as long.—Not seen by Chodat; marked according to the author by the distant (12–20 mm. apart) thick revolute leaves, long peduncles, and lateral petals.

Peru(?): Muña (Huánuco?), *Pearce*, type.

Polygala platycarpa Benth. Pl. Hartw. 115. 1843; 25.

Erect or ascending, subsimple, 2–5 dm. high; puberulent leaves subsessile, ovate, cuspidate, long-acuminate but not mucronate, 6–8 cm. long, 2.5–4.5 cm. wide, thin, sparsely hirtellous and ciliate above, lightly pubescent beneath especially on midnerve and slender veins; racemes terminal or axillary, 6–8 cm. long, axis pubescent; bracts linear; pedicels hirsute, 2–3 mm. long; flowers 7–8 mm. long; outer sepals lance-linear, acute, long-ciliate; wings narrowly elliptic, obscurely ciliate, glabrous beneath, longer than keel; filaments pilose; upper stigma involved in appendage; capsule subcordate-orbicular, ciliate, scarcely emarginate; aril papyraceous, semi-orbicular.—F.M. Neg. 13044.

Peru(?): *Pavón*, herb. Boissier, fide Chodat. Ecuador.

Polygala Ruiziana Chodat, Monogr. pt. 2: 145. 1893.

Stems many, ligneous at base, angulate, densely leafy; leaves petiolate, regularly 4 or 5 verticillate, equaling or longer than the short internodes, lanceolate or linear-lanceolate, acute, mucronate, coriaceous, revolute, glabrous; sepals coriaceous, in length subequal, the upper broader, 3-nerved, elliptic, the lower lanceolate-oblong, subacute; wings distinctly clawed, little longer than corolla, elliptic, 3–5-nerved, the middle nerves few-branched, branches bifid, none anastomosing; upper petals ligulate, slightly inequilateral, oblong,

subequal keel three times longer than wide, one-third connate with staminal tube; crests many, conspicuous, more than half as long as keel; stamens glabrous, the filaments much longer than ovoid anthers; stigma crested; capsule elliptic; seeds oblong-subfalcate, reddish sericeous, the linear appendage half as long.—Illustrated, Chodat, l.c. *pl. 20, fig. 27* (flower).

Peru: *Pavón*, type.

Polygala scleroxylon Ducke, Trop. Woods 50: 35. 1937.

Branchlets usually opposite, angulate, flattened at apex, often spinose in the forks, the vegetative parts entirely glabrous; petioles usually opposite, enlarged and articulate at base, 4–8 mm. long; leaves ovate, lanceolate or oblong, obtuse and complicate at base, shortly or rather long- but obtusely acuminate, 6–14 cm. long, 2.5–6 cm. wide, entire, subcoriaceous, concolored but yellowish in drying, lustrous above, midnerve little prominent, the slender 6–10 lateral nerves anastomosing before the margin; inflorescence axillary, basal bracts small, rigid, pilose; peduncle 5–8 mm. long, erect, puberulent; 3 outer sepals 3 mm. long, 2 mm. wide, convex, apically puberulent, 2 interior caducous, aliform, spreading, 6–8 mm. long, 4–5 mm. wide, long-clawed, glabrous, yellow; lower petals scarcely 3 mm. long, clavate-oblong, 2 upper 7–8 mm. long, narrow, dilated toward tip, pale yellow, obscurely violet spotted, glabrous except ciliolate base; stamen tube 7 mm. long; style glabrous, compressed below, upper third recurved; stigma subcapitate; fruit unknown.—Section *Acanthoclados*, the type 15 meters tall with dense hard wood, opposite leaves, yellow flowers; from Huymatá.

San Martín: Juanjuí, *Klug 4344* (det. Killip); also *3830* (det. Standley, *Securidaca*, sp. nov.). Brazil.

Polygala spectabilis DC. Prodr. 1: 331. 1824; 79.

Shrubby, to a meter or more high, the leafy flowering branches puberulent, the elliptic-lanceolate acuminate leaves glabrous or nearly, 5–10 cm. long, 2.5–4 cm. wide, more or less oblique at base; racemes terminal or in the upper axils, puberulent as the pedicels, these 4–5 mm. long, the bracts deciduous; buds subglobose; outer sepals very unequal, wings suborbicular, 6–8 mm. long or soon much longer, eciliate, the glabrous petals a third longer; style much enlarged at curved tip; capsules obcordate, as long as the persisting wings, the sericeous conical seeds crowned with rather broad shorter dependent aril.—Flowers apparently sometimes attain 4 cm. but

according to Chodat only 2–2.5 cm. In my specimens the wings are 12 mm. long, green with purple margin, corolla 2 cm. long, cream-colored; the leaves are about 8 cm. long, 2–2.5 cm. wide. Illustrated, Deless. Icones 3. *pl. 18.*

Junín: Hacienda Schunke, La Merced, 1–3 meter half-shrub in sunny brush, *5763;* also, *Schunke 1585* (both det. Chodat). Brazil.

Polygala translucida Chodat, Bot. Jahrb. 52: Beibl. 115: 77. 1914.

Annual, from a short little branched root, the erect stem 5 dm. high or higher, the branches corymbose, pubescent with incurved and spreading trichomes; petioles to 1 mm. long; leaves very thin (nerves erect-spreading), ovate-lanceolate, acute and shortly mucronate, ciliolate, 3.5–5 cm. long, 12–20 mm. wide; racemes supra-axillary, very slender, axis (0.4 mm. thick) pubescent, 5–12 cm. long; pedicels filiform, 2(–4) mm. long; outer sepals glandular pilose, 2 lower two-thirds connate, very acute, reticulate; wings broadly ovate or suborbicular, equilateral, nerves more or less anastomosing; keel apically sinuate-rugose; ovary glabrous; stigma lateral; capsule shorter than wings, emarginate; seeds cylindric, sericeous, 2 mm. long, aril 1 mm. long.—Like *P. orobus* Chodat, 51, of Brazil (*Hebeclada*) but wings not at all cuneate, racemes conspicuously extra-axillary, flowers a little large (Chodat). Petals greenish-white, tipped variously with purple (Stork).

Piura: At Serrán, southeast of Piura, about 300 meters, *Weberbauer 5982,* type; *Stork 11377* (det. Johnst.).

Polygala violacea Vahl, Symb. Bot. 2: 79. 1791; 58.

Stems ascending-erect or decumbent at the often subligneous base, 1–several dm. high, pubescent or the branches hirsute; petioles 2 mm. long; leaves ovate-lanceolate, more or less acuminate, 2.5–5 cm. long, 12–16(20) mm. wide, pale green, puberulent or on the veins beneath pubescent and with a few white trichomes above, ciliate, pellucid punctate; racemes mostly terminal, laxly flowered, 2.5–4 cm. long; bracts lanceolate, ciliate, deciduous, subequaling the 2–4 mm. long (1 mm. long, Chodat) pedicels, these articulate at base, deflexed; flowers 4(5) mm. long and wide, outer sepals puberulent, subequal, the 2 lower coalescent, ciliate, the violet wings glabrous (or ciliolate?), orbicular, longer than the ciliate keel, persisting and subequaling the capsule, this elliptic, 2.5–3 cm. wide, 4 mm. long, glabrous but ciliolate marginally; upper petal nearly free,

roseate, subhirsute within below and apically dilated; seeds very villous.—Found at La Paz according to Bennett and so to be expected in southern Peru. Illustrated, Mart. Fl. Bras. 13, pt. 3: *pls. 5* and *30* (seed); Chodat, l.c. *pl. 15* (upper petal and capsule).

Peru (probably). Widely distributed in warmer regions.

Polygala Weberbaueri Chodat, Bot. Jahrb. 42: 97. 1908.

Annual or perhaps biennial with short simple erect stems (often solitary), sometimes ligneous at base, slender, 5–7 mm. thick, 1–2.5 dm. high, branches if present few, erect; leaves alternate or the lower verticillate, linear, acutish, 6–10 mm. long, 0.5–1 mm. wide, glabrous, caducous; racemes elongate, axis erect, slender, scarcely tuberculate, pedicels 0.6 mm. long, finally recurving; flowers to 4 mm. long, greenish-purple; sepal glabrous, upper ovate, 3-nerved, the nerves usually simple, upper petals rhombic, very acute, equaling or longer than the much cristate keel; ovary retuse; style curved; stigma oblique; capsules ovoid, glabrous, shorter than the straw-colored wings; seeds cylindric, obtuse with much shorter broad appendages.—Var. *dolichocarpa* Chodat, l.c. is said to have more ellipsoid capsules, scarcely shorter than the wings, and purple flowers—maybe a more mature status. Affine *P. boliviensis* Bennett, 176, according to the author, but capsules shorter than wings, seeds not at all acute, upper petals broader. F.M. Neg. 13057.

Cajamarca: In grass-shrubs, 2,600 meters, Hacienda La Tahona to Hualgayoc, *Weberbauer 4038*, type, and, for the variety, *4153*.

2. BREDEMEYERA Willd.

With many of the characters of *Polygala* but probably always more or less scandent, never herbaceous, sepals always deciduous, petals never cristate. Stigma curved. Capsules cuneate-spathulate or obovate, usually emarginate, often inequilateral. Seeds estrophiolate and with a silky coma as long as or longer than the body.

Flowers about 4 mm. long or longer; leaves usually drying greenish with yellowish veins..... *B. floribunda.*

Flowers 2–3 mm. long or shorter; leaves usually darkening in drying, or brownish.

Wings glabrous; leaves about a third as wide as long, or acuminate.

Leaves typically glabrous, somewhat ovate-acuminate.

B. myrtifolia.

Leaves softly pubescent beneath, oblong-elliptic, acute. *B. densiflora.*

Wings puberulent; leaves elliptic, shortly acute, nearly half as wide as long..... *B. altissima.*

Bredemeyera altissima (P. & E.) Bennett in Mart. Fl. Bras. 13, pt. 3: 50. 1874. *Catocoma altissima* Poepp. & Endl. Nov. Gen. & Sp. 3: 65. *pl. 273.* 1845.

Flowering branches including the ample branching panicles puberulent, the leaves soon glabrous, lustrous, subcoriaceous, elliptic, acute or abruptly apiculate, typically to 1.5 dm. long and half as wide or in Peru much smaller; sepals ovate, puberulent as the ciliate concave orbicular wings, the greenish-yellow or white fragrant flowers 2–3 mm. long; style enlarged and rectangularly curved medially; fruit broadly obovate, emarginate, 8–10 mm. long, 4–6 mm. wide.—Apparently, as Bennett suggested, should include the smaller-leaved *B. lucida* (Benth.) Bennett, l.c. page 51, which may be the Peruvian plant, *B. altissima* var. **amazonica** Chodat, in herb. differt foliis elliptico-lanceolatis minoribus.

Loreto: Mishuyacu near Iquitos, *Klug 405*, type, var.; also *1547*. Brazil.

Bredemeyera densiflora Bennett in Mart. Fl. Bras. 13, pt. 3: 52. 1874.

Glabrous or usually soft pubescent, especially the leaves beneath, these subcoriaceous, elliptic, acuminate, about 4 cm. long and half as wide; flowers greenish-white, densely crowded, a mm. or at least scarcely 2 mm. long in narrow panicles 7–15 cm. long, leafy below; bracts long-ciliate; outer sepals subequal, triangular, ciliate, the wings and petals glabrous; style curved.—Much more information is necessary before the taxonomic significance of the differences observed, apparently slight, between the few collections known for many of the recognized species here and in the other genera, will be clear and their importance proved. Illustrated, Mart. Fl. Bras. l.c. *pl. 18.* F.M. Neg. 13078.

San Martín: Río Mayo near Tarapoto, *Spruce 4801* (under name *Catacoma parviflora*). Lamas, *Williams 6397;* also *Mathews 1621bis.* Guiana.

Bredemeyera floribunda Willd. Neue Schrift. Ges. Naturf. Freunde Berlin 3: 411. *pl. 6.* 1801; Mart. Fl. Bras. 13, pt. 3: 48. 1874.

Flowering branchlets slightly puberulent, the divaricate branches of the often large basally leafy panicles usually more densely, as also the upper petioles, these 5–8 mm. long; leaves oblong-elliptic, acute, somewhat lustrous above, drying yellowish-green, duller and glabrous or puberulent beneath, mostly 7–10 cm. long, 2.5–4 cm. wide, the fine yellowish nerves and veins about equally prominent both sides; flowers about 4–5 mm. long (5–6 mm., white, very fragrant, abundant: Dugand); pedicels 2 mm. long; lower outer sepals suborbicular, concave, ciliate; wings 4 mm. long, half as wide, ciliate and pubescent within, often yellow, the keel usually greenish; stamen sheath notably ciliate; ovary hirsute; style little curved; fruit glandular or puberulent, 12 mm. long, a fourth as wide (truncate, 15–19 mm. long: Dugand) with brown lustrous sericeous and comate seeds.—My specimens were from slender open shrub, wood-edge, long branches liana-like in trees or sunny brush. Flowers have been described as fragrant, greenish-yellow and white and the lower stems as a dm. thick or larger. The Amazonian *B. brevifolia* Klotzch has leaves softly pubescent, at least beneath, 2.5–4 cm. long, 2–2.5 cm. wide, white flowers and finally glabrous fruits. Illustrated, St. Hil. Fl. Bras. 2. *pl. 91* (as *Comesperma*). F.M. Neg. 13079.

Junín: Hacienda Schunke above San Ramón, *5610; 5807; Schunke A117* (det. Killip); also *1376; 1470; 280.* Brazil; Colombia.

Bredemeyera myrtifolia [Spruce] Bennett in Mart. Fl. Bras. 13, pt. 3: 50. 1874. *B. parviflora* [Spruce] Bennett, l.c. 51, fide Chodat in herb.

Scandent branches puberulent; petioles short; leaves ovate-elliptic, more or less acuminate, 4–5(7) cm. long, about half as wide, glabrous, lustrous, subcoriaceous; panicles yellowish or golden puberulent, the branches often remote but the small yellow-green flowers approximate; outer sepals ovate, ciliate, the orbicular mucronulate wings glabrous as the small upper petals, the keel obsoletely ciliate below; staminal sheath hirsute above; ovary glabrous; style sparsely pubescent, rectangularly curved.—Bennett had noted the mucronation of the wings, the distinctive character for *B. parviflora,* as variable. Determinations by Chodat. Illustrated, Mart. Fl. Bras. l.c. *pl. 18.*

San Martín: Lamas near Tarapoto, *Mathews 1621.*—Loreto: Mishuyacu near Iquitos, *Klug 29; 293.* Iquitos, *Sandeman 2284; Williams 3653; 3700; 8092; Killip & Smith 26952; 26972.* Lower Río Nanay, *Williams 655.* Brazil.

3. SECURIDACA L.

Reference: A. J. P. Oort, Med. Bot. Mus. Rijks Univ. Utrecht 71. 1939.

Scandent shrubs with the characters in general of the other groups but sepals usually deciduous and with compressed 1-celled ovary gibbous above and 1-ovuled with lateral curved style and simple stigma, and, most distinctively, a dry indehiscent rugose or hirsute fruit with a large erect wing and 1 estrophiolate naked seed.—While Oort's work, except for *S. volubilis*, is not descriptive it is highly valuable in its interpretation of earlier species; acknowledgment of my indebtedness is made with pleasure.

Leaf-nervation not prominent above, the leaves softly puberulent-tomentose, especially beneath.

Leaves mostly or all 4–6 cm. long, (1.5)2–3.5 cm. wide; wings ciliate.....*S. volubilis.*

Leaves mostly 2–3 cm. long, 1–2 cm. wide; wings glabrous or nearly.....*S. rivinaefolia.*

Leaf-nervation prominently reticulate above where often glabrous or puberulent beneath, the texture firm.

Inflorescence as long or longer than the leaves.

Leaves somewhat puberulent; flowers 8–11 mm. long.

Pedicels 4–7 mm. long; fruit wing 3–5 cm. long; leaves often ovate, about a third longer than wide....*S. diversifolia.*

Pedicels 1–3 mm. long; fruit wing about 1 cm. long; leaves often oblong-elliptic, many about twice as long as wide. *S. longifolia.*

Leaves glabrous or nearly; flower 4–6 mm. long; pedicels 0.5–2 mm. long; fruit 4–6-ribbed, the wing at most 22 mm. long.....*S. paniculata.*

Inflorescence axillary, far exceeded by the large leaves. *S. macrophylla.*

Securidaca diversifolia (L.) Blake, Contr. U. S. Nat. Herb. 23: 594. 1923; 680. *Polygala diversifolia* L. Sp. Pl. 703. 1753. *S. mollis* HBK. Nov. Gen. & Sp. 5: 421. 1823 (as var., below). *S. volubilis* L. var. *mollis* (HBK.) Bennett in Mart. Fl. Bras. 13, pt. 3: 62. 1874. *S. pubescens* DC. and var. *ovata* DC. Prodr. 1: 341. 1824.

Similar to *S. volubilis* with which it apparently sometimes merges, but the leaves, however variable in shape and size, are

characteristically reticulate-veined on the upper surface, the fruit thin-walled and slightly reticulate (Oort); petioles typically several mm. long, the leaves nearly glabrous or minutely puberulous except in the variety *mollis;* flowers pale lilac to cerise or the keel yellowish; wings emarginate, 8.3–11.8 mm. long (Blake).—According to Oort the var. *mollis* (HBK.) Oort, 681, is very near but has broader leaves with petioles only 1–2 mm. long, the indument soft and denser. *S. amazonica* Chodat, Trans. & Proc. Bot. Soc. Edinb. 22: 427. 1905 of Putumayo region, Colombia and probably also in Peru, seems to belong here or to be scarcely separable. F.M. Negs. 34938 (*S. pubescens*); 34985 (*S. mollis*).

San Martín: Zepelacio, *Klug 3710* (det. Standley, *S. longifolia*). Juanjuí, *Klug 4350* (det. Standley, *S. volubilis*). Tarapoto, *Spruce 4853* (var.).—Huánuco: Shapajilla, 630 meters, *Woytkowski 35* (det. Standley, *S. longifolia*).—Junín: Vitoc, near San Ramón, *Soukup 2471* (det. Killip, *S. volubilis*).—Loreto: Gonzalo-Vijil road, Iquitos, *Mexia 6516* (det. Standley, *S. volubilis*). Without locality, *Pavón* (var. *mollis*, fide Oort). To Central America.

Securidaca longifolia Poepp. & Endl. Nov. Gen. & Sp. 3: 66. 1845.

Branchlets, densely flowered inflorescences and leaves beneath minutely puberulent; petioles about 4 mm. long; leaves, at least those of flowering branchlets, unequal in size and shape but the larger usually rather oblong-elliptic, 1–1.5 dm. long, 5–6 cm. wide, the smaller more ovate, all acute or barely acuminate, often rounded or subcordulate at base, prominently reticulate-veined and slightly lustrous above; racemes axillary and terminal, sometimes 1.5 dm. long, the showy violet flowers about 10 mm. long, crowded because of the short pedicels in anthesis, these scarcely 3 mm. long even in fruit; wings puberulent, enlarged in age; keel beautifully cristate; fruit with wing less than 2 cm. long, corrugate-rugose, with rather prominent dorsal wing, the proper wing about 1 cm. long.—Illustrated, Mart. Fl. Bras. 13, pt. 3: *pl. 24.* F.M. Neg. 32383.

Loreto: Río Itaya, *Williams 121; 122.* Iquitos, *Williams 3668; Klug 425* (both det. Chodat); *Klug 687; Killip & Smith 27038* (distr. as *S. Hostmanni*). Brazil.

Securidaca macrophylla Benth. ex Walp. Repert. Bot. 1: 247. 1842, at least as to name. *Corytholobium macrophyllum* Benth. Ann. Naturh. Hofmus. Wien 2: 93. 1838. *Monnina calophylla* Poepp. & Endl. Nov. Gen. & Sp. 3: 66. 1845. *S. decora* Poepp. & Endl. l.c.?

(not seen). *S. Corytholobium* [Benth.] Bennett in Mart. Fl. Bras. 13, pt. 3: 68. 1874.

Glabrous; petioles 5 mm. long; leaves elliptic or oblong-elliptic, rarely ovate-elliptic, 1.5–2 dm. long, 8–15 cm. wide, rounded cordulate at base, obtusely or shortly and obtusely acuminate, lustrous and strongly reticulate-venose above, paler, dull, both nerves and veins prominent beneath; racemes 2–4, axillary, to 2 cm. long, puberulent; pedicels to 5 mm. long or longer; flowers 6–8 mm. long; sepals broadly ovate, acute, little ciliate; wings glabrous or minutely ciliolate, suborbiculate; lateral petals erect, keel cucullate, ecristate, glabrous; fruit coriaceous, glabrous, 2 cm. long, 12–18 mm. wide, reticulate, the oblique wing 6–8 mm. long, 14 mm. wide.—Distinctive by the large leaves and the short axillary inflorescences. Illustrated, Mart. Fl. Bras. 13, pt. 3: *pl. 26*.

Loreto: In clearing, Mishuyacu near Iquitos, *Klug 233*. Brazil.

Securidaca paniculata Rich. Act. Soc. Hist. Nat. Paris 1: 111. 1792; 682. *S. Hostmanni* Miq. Stirp. Surin. Sel. 30. 1850, fide Oort.

Glabrous except for the minute puberulence of the branches, petioles, these 2–4 mm. long, and sepals; racemes often several, axillary and paniculate at apex of branches, the pale lilac to violet flowers 4–6 mm. long on pedicels 0.5–2 mm. long; outer sepals ciliate, glabrous within, subequal; wings suborbicular, ciliate toward claw, revolute apically; upper petals ligulate, erect; keel lacerate-dentate, pubescent without; ovary glabrous; style curved to horizontal above (after Bennett).—The Peruvian material has oblong-elliptic leaves rounded or cordulate at base, shortly acuminate, equally prominently reticulate both sides, glabrous or nearly, mostly 8–10 cm. long, 4.5–5.5 cm. wide. According to Oort the shape and size of fruit and wings vary much but the 4–6 longitudinal ribs are prominent at least in the fertile and the proper wing is never longer than 22 mm. (Oort). Illustrated, Mart. Fl. Bras. 13, pt. 3: *pl. 25;* Oort, l.c. *pl. 13* (fruits). F.M. Neg. 13094 (*S. Hostmanni*).

San Martín: Zepelacio, *Klug 3659* (det. Standley).—Loreto: Mishuyacu, *Klug 1371; 1298; 1352*. Iquitos region, *Tessmann 3598; 5335* (det. Oort). To the Guianas.

Securidaca rivinaefolia St. Hil. Fl. Bras. 2: 69. 1829; 685.

Much like *S. volubilis* but the softly tomentose leaves (usually tomentose both sides) only 2–3 cm. long, 1–2 cm. wide unless for an

occasional one about 4 cm. long, 2.5 cm. wide, typically barely acute; flowers 6–8 mm. long, lilac or rose color, on pedicels 2–4 mm. long; sepals tomentose; wings orbicular, in type glabrous or scarcely ciliate; fruits tomentose typically, including the proper wing, 3–4 cm. long.—The var. *parvifolia* [Spruce] Bennett, Mart. Fl. Bras. 13, pt. 3: 65, has oblong-elliptic leaves 2.5 cm. long, 1 cm. wide, densely tomentose both sides, obtuse or emarginate, the scarcely veiny fruit 3 cm. long or longer. More material in fruit may show the Peruvian plant to be specifically distinct, as Chodat in herb. has suggested; aberrant, too, is *Klug 3311*, which may be designated var. **seorsa** Macbr., var. nov., differt alis puberulis. Illustrated, Mart. Fl. Bras. 13, pt. 3: *pl. 30*, B, *fig. 7* (fruit). F.M. Neg. 21389 (var.).

Cajamarca: Tambillo, *Jelski 230; Stork & Horton 10176.*—Huánuco: Hacienda Mercedes, Churubamba, 1,750 meters, *Mexia 8230* (det. Standley). Cuchero, *Poeppig.* San Martín: Juanjuí, *Klug 3311* (type, var. *seorsa*).—Loreto: Río Mazán, *José Schunke 96* (var.; det. Standley, *S. parvifolia*). Iquitos, *Killip & Smith 29840; Williams 3732.* Mishuyacu, *Klug 324; 1171.* Río Nanay, *Williams 776; 1100; 1150.* To Guiana and Central Brazil. "Coca-sisa," "enredadera."

Securidaca volubilis L. Sp. Pl. 707. 1753; 679.

Scandent, the newer parts densely puberulent; petioles 2–4 mm. long; leaves elliptic-ovate, subcuneate at base, rounded at tip, 1.5–3.5 cm. wide, 3–6 cm. long, opaque and softly puberulent especially beneath, nervation obscure, margins little thickened and involute; racemes terminal and axillary, rather lax; pedicels 4–5 mm. long; flowers 8–10 mm. long, violet; sepals puberulent without; wings equilateral or inequilateral, obtuse, ciliate; outer petals spathulate-ovate, obtuse; keel cristate; fruit 4.5–6 cm. long; seed part globose, 10–12 mm. in diameter, appendage membranous, reticulate; wing 3.5–5 cm. long, acute or obtuse, dorsal wing small, membranous, partly connate with proper wing (after Oort).

Peru(?): Without locality, *Poeppig*, fide Oort. To the Guianas.

4. MONNINA R. & P.

By Ramón Ferreyra

Reference: Ramón Ferreyra, Journ. Arnold Arb. 27: 123–167. 1946.

Herbs, shrubs or trees sometimes scandent with alternate entire leaves, unless in *M. menthoides*, rarely 1-nerved; racemes terminal

or axillary, rarely aggregate, the peduncle usually bracted above. Sepals 5, the 3 outer free, herbaceous or the 2 lower united, the 2 inner (wings) petaloid, usually much larger and more or less concave. Petals 3, the lower (keel) carinate, the 2 upper ligulate, usually elongate, united below to the staminal sheath. Stamens 8 or 6, the filaments united nearly to apex into a sheath or split on the upper side; anthers 1- to 2-celled, sometimes emarginate or mucronate. Ovary rarely 2-celled; style geniculate, exceptionally rather straight, sometimes auricled; stigma with 2 dissimilar lobes, the lower more or less acute, the upper papillose with one or two tubercles. Disk ordinarily reduced to a gland at base of ovary. Fruit a drupe with thin fleshy coat, rugose, sometimes samaroid, narrowly and subequally winged.

With the author's approval I have compiled this for him; the wording is thus, for convenience and in the interest of uniformity, often mine and of course I take responsibility for omissions and mistakes. I take great pleasure in having Dr. Ferreyra as a contributor and hope that Peruvian botanists will have the opportunity to take an ever greater part in the study of their economically important but little known flora.

M. polygaloides Chodat was apparently never described; *M. nitida* Chodat, Bull. Herb. Boiss. 3: 130. 1895, based on a specimen by Pavón, possibly from Peru, cannot be placed from description and is essentially a nomen nudum; *M. rugosa* Chodat l.c. 4: 251. 1896, based upon a plant collected in Peru but without other data, is also unrecognizable from the inadequate description.

Plants annual, rarely frutescent, small; fruit usually winged, rarely without wings.

Androecium with 6, rarely with 8, stamens; style with 2 auricles.

Stem relatively thick, to 25 dm. high; lower leaves ovate-lanceolate, the upper linear-lanceolate.....*M. pterocarpa.*

Stem slender, always less than 10 dm. high; lower leaves linear-lanceolate or oblanceolate.

Racemes usually with a short axis, 1–2.8 dm. long; leaves obtuse or emarginate, sometimes acuminate; wing of fruit almost always purple.....*M. amarella.*

Racemes always with a long axis, 1.8–4.5 dm. long; leaves acute; wing of fruit greenish.

Lower leaves filiform; fruit puberulous; stamens united. *M. filifolia.*

Lower leaves lanceolate; fruit glabrous; stamens free in the upper part, unequal.....*M. graminea.*

Androecium always with 8 stamens; style without auricles.

Ovary puberulous; stamens united for two-thirds their length, the free part conspicuous; style geniculate from near its base; fruit cordiform, densely puberulous.....*M. herbacea.*

Ovary glabrous; stamens entirely united; style nearly straight or geniculate below the apex; fruit ovate, glabrescent, sometimes finely puberulous.

Leaves linear; keel glabrous within, the apex emarginate; upper petals elongate-spathulate.

Root thick, subfrutescent; leaves revolute; lower sepals 3-nerved, ciliate; style thicker toward apex; fruit puberulous.....*M. ramosa.*

Root thin, herbaceous; leaves not at all revolute; lower sepals 1-nerved, eciliate; style cylindric; fruit glabrescent.....*M. Macbridei.*

Leaves ovate-lanceolate; keel puberulous within, the apex acute; upper petals short.

Flowers white; lower sepals glabrous; base of keel obtuse, glabrous; fruit puberulous.....*M. arenicola.*

Flowers not white; lower sepals ciliate; base of keel acute, ciliate; fruit glabrescent.

Drupe to 3 mm. long; upper sepal to 3-nerved, glabrous beneath; upper stigma-lobe short...*M. Weberbaueri.*

Samara to 5 mm. long; upper sepal to 5-nerved, puberulous beneath; upper stigma-lobe elongate, ciliate. *M. macrostachya.*

Plants perennial, frutescent or arborescent, sometimes scandent; fruit without wings, rarely with a very small wing.

Lower sepals united.

Inflorescence to 3.2 dm. long; flowers not crowded, with filiform and conspicuous bracts.

Bracts with involute apex; leaves usually acute; upper petals oblong; anthers obtuse or emarginate..*M. longibracteata.*

Bracts with straight apex; leaves acuminate; upper petals spathulate; anthers mucronate.....*M. huallagensis.*

Inflorescence to 2.2 dm. long; flowers crowded, without filiform bracts.

Racemes simple, terminal; leaves usually lanceolate, rarely more or less elliptic.

Ovary pubescent.

Apex of racemes with oblanceolate bracts to 2 mm. wide, lax; fruit cordiform; lower sepals 5-nerved, larger than the upper one.....*M. glabrifolia.*

Apex of racemes without bracts or these narrow; fruit ovate; lower sepals 1–3-nerved, smaller than the upper one.

Leaves to 4.5 cm. long; racemes slender, lax; fruit ovate-cordiform, with a very small wing.

Branches tomentose; leaves lanceolate, puberulous, acute-mucronate; racemes hirsute.
M. menthoides.

Branches glabrescent; leaves more or less elliptic, obtuse, glabrescent as also racemes.*M. andina.*

Leaves to 10 cm. long; racemes thicker, straight; fruit elliptic, not at all winged.

Stem with branches corymbose; leaves narrowly lanceolate; lower sepals 1-nerved, upper 3-nerved; wings puberulous beneath.
M. marginata.

Stem with branches not corymbose; leaves often elliptic; lower sepals 3-nerved, upper 5-nerved; wings glabrous beneath...*M. pseudo-salicifolia.*

Ovary glabrous.

Bracts linear-lanceolate, 3–6 mm. long; leaves linear-lanceolate, acuminate; outer sepals to 5 mm. long; free part of filaments puberulous..*M. macrosepala.*

Bracts ovate-triangular, less than 2.5 mm. long; leaves usually elliptic, obtuse; outer sepals to 3 mm. long; free part of filaments glabrous.

Branches conspicuously corymbose; leaves usually deciduous, to 4.5 cm. long.

Stem 3 dm. high; axis of inflorescence less than 1.6 cm. long; lower sepals strongly 1-nerved; keel 2-lobed; anthers mucronate....*M. Vitis-Idaea.*

Stem 18 dm. high; axis of inflorescence 3–10 cm. long; lower sepals faintly 3-nerved; keel 3-lobed; anthers not mucronate.....*M. conferta.*

Branches not corymbose; leaves not deciduous, to 9 cm. long.

Leaves revolute, the nerves obvious; petioles to 6 mm. long; branches densely puberulous; outer sepals 5–7-nerved; wings glabrous within. *M. stipulata.*

Leaves not revolute, the nerves faint; petioles to 3 mm. long; outer sepals 1–3-nerved; wings puberulous within.

Branches almost glabrescent; leaves firm, nerves 4–5..... *M. canescens.*

Branches puberulent; leaves membranous, nerves 6–8..... *M. membranifolia.*

Racemes in wide panicles; leaves usually elliptic, rarely more or less lanceolate.

Ovary pubescent.

Erect shrub, glabrescent, rarely slightly puberulous.

Bracts to 3 mm. long.

Axis of panicle to 25 cm. long, racemes glabrous; leaf-axils without leaflets; outer sepals 3–5-nerved; wings acutish at base; anthers mucronate; ovary with a few hairs near its base. *M. divaristachya.*

Axis of panicle to 13 cm. long, racemes puberulous; leaf-axils with leaflets; outer sepals 1-nerved; wings obtuse at base; anthers emucronate; ovary puberulous..... *M. callimorpha.*

Bracts 7–9 mm. long..... *M. amplibracteata.*

Scandent shrub, usually densely hirsute, rarely glabrous.

Leaves elliptic or ovate, glabrescent, obtuse; branches striate, glabrescent; lower sepals 3-nerved, obtuse. *M. ovata.*

Leaves almost lanceolate, puberulous, acute; branches terete, densely hirsute; lower sepals 1-nerved, acute.

Hairs of branches to 2.5 mm. long, lax; leaves densely puberulous above; style glabrous; ovary puberulous near base..... *M. polystachya.*

Hairs of branches to 1 mm. long, rigid; leaves more or less glabrescent above; style puberulous; ovary totally puberulous.

Axis of panicle to 24 cm. long; branches glabrescent; wings glabrous; keel puberulous within, glabrous on convex longitudinal line; style puberulous near base; anthers mucronate.....*M. Pavoni.*

Axis of panicle to 12 cm. long; branches puberulous; wings puberulous beneath, ciliate; keel glabrescent or with a few inconspicuous hairs within, puberulous on convex longitudinal line; style puberulous on upper part; anthers emucronate.....*M. pseudo-polystachya.*

Ovary glabrous.

Panicles with divaricate racemes; leaves elliptic; filaments puberulous.

Branches terete, densely hirsute; leaves to 5 cm. long. *M. Ruiziana.*

Branches striate, more or less glabrescent; leaves to 10 cm. long.....*M. connectisepala.*

Panicles with decurrent or ascendent racemes; leaves lanceolate; filaments glabrous.

Racemes and flowers conspicuously crowded; lower sepals obtuse, the upper 5–7-nerved; upper petals short-oblong.....*M. Lechleriana.*

Racemes and flowers not crowded; lower sepals acute, the upper 3-nerved; upper petals elongate-spathulate.....*M. Clarkeana.*

Lower sepals free.

Inflorescence in simple racemes, axillary or terminal.

Ovary glabrous.

Apex of racemes with ovate-acute conspicuous bracts; branches glabrescent; lower sepals glabrous beneath, the upper sepal 7-nerved.....*M. ligustrifolia.*

Apex of racemes with triangular-acuminate and inconspicuous bracts; branches puberulous; lower sepals puberulous beneath, the upper sepal 3–5-nerved.

Petioles to 2.5 mm. long; leaves to 7 cm. long, elliptic, obtuse; wings ciliate.....*M. salicifolia.*

Petioles to 5 mm. long; leaves to 11 cm. long, lanceolate, acuminate; wings eciliate.....*M. hirtella.*

Ovary pubescent.

Branches canescent-hirsute; leaf length less than 3 times width; drupe cordiform, flattened; keel glabrous within, the lateral lobes elongate; style glabrous. *M. cyanea.*

Branches glabrescent; leaf length more than 4 times width; drupe ovate or elliptic; keel puberulous within, the lateral lobes short; style puberulous.

Leaves elliptic, crowded, to 2.8 cm. long, obtuse; bracts to 1 mm. long; outer sepals puberulous beneath; wings puberulous within.....*M. decurrens.*

Leaves linear-lanceolate, not crowded, to 12 cm. long, acute; bracts to 2.8 mm. long; outer sepals glabrous beneath; wings glabrous within.....*M. peruviana.*

Inflorescence in panicles or aggregate racemes.

Apex of leaves acuminate or acute.

Stem scandent, slightly hirsute; racemes numerous, lax, slender, with filiform bracts.....*M. Mathusiana.*

Stem not scandent, erect, densely hirsute; racemes not numerous, aggregate, ascendent, thicker, usually with ovate-lanceolate bracts.

Axis of racemes to 31 cm. long; leaves thin, with 5 or 6 pairs of lateral veins.....*M. acutifolia.*

Axis of racemes to 10 cm. long; leaves thicker, with 7 or 8 pairs of lateral veins.

Leaves lanceolate; wings ciliate; ovary more or less puberulous.....*M. Vargasii.*

Leaves oblong; wings glabrous; ovary glabrous. *M. pilosa.*

Apex of leaves usually obtuse, rarely acute.

Racemes numerous; wings puberulous beneath.

Margin of leaves revolute, apex not attenuate; racemes lax; upper sepal obtuse; wings glabrous within; keel puberulous within.....*M. densecomata.*

Margin of leaves not revolute, apex attenuate; racemes rigid; upper sepal acute; wings puberulous within; keel glabrous within.....*M. tomentella.*

Racemes aggregate, sometimes simple, terminal; wings glabrous beneath.

Leaves acute; petioles to 7 mm. long; outer sepals to 3.5 mm. long, puberulous beneath, apex straight, lower 1-nerved.....*M. Herrerae.*

Leaves obtuse; petioles to 4.5 mm. long; outer sepals to 7 mm. long, glabrous beneath, apex involute, lower 3-nerved.....*M. pachycoma.*

Monnina acutifolia Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 206. 1934; 162.

Shrub, more or less pubescent, becoming glabrescent, to 3 meters high, the branches 3–6 mm. thick; petioles 2–7 mm. long, almost cylindric; leaves lanceolate, usually acute, 2.5–7.5 cm. long, 7–20 mm. wide with 5–6 lateral veins; racemes aggregate, sometimes simple, terminal more or less acute, 8–11 mm. wide, subsessile, the pubescent rachis 4.5–31 cm. long, the bracts filiform; flowers 4–4.5 mm. long, the pedicels scarcely 1 mm. long; outer sepals free, almost triangular, acute, pubescent beneath, the two lower to 2.3 mm. long, 3-nerved, the slightly longer upper one 5-nerved; wings 4–4.4 mm. long, 3-nerved and glabrous as the keel, this 4.6–5.5 mm. long, 3-lobed; upper petals elongate, pubescent; stamens 8, the filaments almost entirely united, the free part glabrous; ovary elliptic, glabrous as the geniculate cylindric style, the lower stigma lobe acute, the upper with one papillose tubercle; drupes elliptic, acute, 5–6 mm. long, glabrous, notably reticulate.—Related to *M. salicifolia.* Illustrated, Ferreyra, l.c. *pl. 9.*

Ayacucho: Ccarrapa, 1,500 meters, Huanta to Apurímac River, *Killip & Smith 22448,* type; *23228.*

Monnina amarella Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 200. 1934; 133.

Herbaceous annual sometimes 8 dm. high from a usually simple root, the erect terete stem with finely pubescent branches 3–50 cm. long; petioles to 1.5 mm. long, glabrescent as the oblanceolate or linear-lanceolate leaves, these attenuate at base, usually obtuse, sometimes emarginate, 10–44 mm. long, 2–10 mm. wide, the lateral veins inconspicuous; racemes terminal, conical, acute, 7–9 mm. wide, the axis to 3 dm. long, slightly pubescent with glabrous deciduous filiform bracts 1.5–8 mm. long; flowers 3–3.8 mm. long, the glabrous pedicels 0.5–0.7 mm. long; outer sepals free, lanceolate, glabrous,

acute, the two lower 1–1.4 mm. long, 1-nerved, the upper one 2.2 mm. long, rarely ciliate, 3-nerved as the glabrous purple obovate wings, these 2.8–3.2 mm. long, keel yellow, about 3.5 mm. long, orbicular, plicate, glabrous, 4- or 5-nerved, the middle lobe obtuse-emarginate; upper petals pubescent within; stamens 6, the sheath glabrous, the sessile anthers emarginate; ovary glabrous as the subequal biauricled style, the upper stigma lobe 1-tubercled; samara ovate, 3.5–5 mm. long, early strigillose, the membranous wing about 1 mm. wide, deeply emarginate at base and apex, the body rugose reticulate.—This is close to *M. filifolia* but it differs clearly in the oblanceolate emarginate leaves; the raceme axis is usually short and the samara wing purple. Altitudinal range 2,900 to 3,600 meters. Illustrated, Ferreyra, l.c. *pl. 1.*

Junín: Viques to Ingahuasi, Mantaro Canyon, south of Huancayo, *Killip & Smith 22152.*—Cuzco: Canyon Chicón, Prov. Urubamba, *Vargas 11061.* Pampa de Anta, vicinity of Huarocando, *Herrera 3638.* Colinas del Saxaihuamán, *Herrera 2388; Pennell 13589.* San Sabastián, *Pennell 13629,* type. Vicinity of Acomayo, Prov. Acomayo, *Vargas 491.* Cuzco, *Herrera 2393.* Near Cuzco, *Herrera 681.* Ollantaytambo, *Cook & Gilbert 522; 530; Pennell 13678.* Calca, *Vargas 1774.* "Urco" (Vargas).

Monnina amplibracteata Ferr. Publ. Mus. Hist. Nat. "Javier Prado" (Universidad Nacional Mayor de San Marcos), *Ser. B.* Botanica 1: 4. 1948.

Shrub or tree to 2.5 meters high, the terete glabrous branches 3–12 mm. thick; petioles 1.5–5 mm. long, glabrous, somewhat articulate; leaves lanceolate, attenuate to base, acute, 2–20 cm. long, 1–6 cm. wide, glabrescent both sides, shortly revolute with 8 to 9 lateral nerves; panicles ample, the elongate, finely pubescent striate conical racemes 2–27 cm. long, 5–8 mm. thick, rachis 4.5–30 cm. long, the peduncles 1–7 cm. long; bracts lanceolate, acute, 7–9 mm. long, puberulent beneath; flowers globose, 3.2–4.2 mm. long, the pedicels to 1.5 mm. long, puberulent; outer sepals triangular, concave, obtuse, 1-nerved, the two lower 2–2.8 mm. long, two-thirds connate, glabrescent beneath, the upper longer, puberulent beneath; wings 4–4.5 mm. long, 3–4-nerved, puberulent beneath, the keel puberulent within to 4.6 mm. long, 3-lobed, 4–5-nerved; upper petals long-spathulate, densely pubescent both sides; stamens 8, the more or less connate filaments with free parts puberulent; ovary oblong, puberulent above, the glabrous cylindric style geniculate near

base; upper stigma lobe papillose tubercled, the lower acute; drupes ovate-oblong, 5–10 mm. long, finely puberulent.—Closely related to *M. divaristachya* but stouter, the leaves acute, glabrescent, the panicle with ascending racemes, the bracts narrowly lanceolate and with other differences. Illustrated, Ferreyra, l.c. *pl. 2.*

Loreto: La Divisoria, Tingo María y Pucallpa, 1,400–1,600 meters, *Ferreyra 984*, type; *2416*. Fundo Nirvana, *Ferreyra 4160*.

Monnina andina Chodat, Bot. Jahrb. 42: 104. 1908; 143.

Glabrescent shrub about 10 dm. high, the branches nodose, petioles short, stipules to 0.5 mm. long; leaves lanceolate-elliptic, attenuate at base, obtuse, 2.5–4.5 cm. long, 9–15 mm. wide, slightly revolute, mid-nerve pubescent; racemes slender, simple, terminal, 5–10 cm. long, with conspicuous linear bracts; flowers 2–3 mm. long; outer sepals ovate, obtuse, ciliate, the two lower united; wings orbicular, oblique, attenuate at base, ciliate; upper petals narrow, incurved apically; filaments almost entirely united, pubescent at apex; ovary oblong, pubescent, the straight style becoming geniculate, the upper stigma lobe globose; samara ovate-cordiform, 3–4 mm. long, slightly winged, pubescent, emarginate at apex.—Some measurements adapted from the photograph, which shows the branches and racemes slender, the former glabrous and the bracts linear. F.M. Neg. 13103.

Puno: Between Sandía and Chunchusmayo, *Weberbauer 1146*, type.

Monnina arenicola Ferr. Journ. Arnold Arb. 27: 137. 1946.

Herbaceous annual with slender simple root and a simple or more or less branched terete shortly pilose stem 3–16 cm. high; petioles glabrous, 0.8–1.5 mm. long; leaves lanceolate or elliptic, long attenuate to base, apically emarginate or obtuse, 1–2.5 dm. long, 4–9 mm. wide, glabrous; racemes shortly conical, 5–6 mm. thick, the rachis 3–8 cm. long, shortly pilose, the linear ciliate bracts 1.5 to 2 mm. long; flowers 2.8–3.2 mm. long on glabrous pedicels 0.4–0.6 mm. long; outer sepals free lanceolate, the two lower about 1.5 mm. long, glabrous, 1-nerved, the upper sepal 1.6–1.8 mm. long, ciliate, 3-nerved; wings whitish, 3–3.5 mm. long, glabrous, 3–5-nerved, the keel as long, obtuse at base, orbicular, pilose within, the middle lobe acutish; upper petals glabrous without; stamens 8, the filaments connate, the anthers sessile; ovary glabrous, the slightly longer glabrous cylindric style more or less geniculate; upper

lobe of stigma bitubercled; samara 4–4.5 mm. long, strigillose, the membranous wings 1–1.6 mm. wide, conspicuously emarginate base and apex.—Illustrated, Ferreyra, l.c. *pl. 2.*

Arequipa: East of Mollendo, sandy plain, *Worth & Morrison 15762.* South of Mollendo, sand dunes near ocean, *Mexia 4175,* type. Hills near Chala, *Ferreyra 1465; 1417.* Near Camana, *Ferreyra 2534; 2570.*

Monnina callimorpha Chodat, Bot. Jahrb. 42: 101. 1908; 150. *M. Killipii* Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 204. 1934.

Erect shrub to 3 meters high with conspicuously pubescent branches, these about 4 mm. thick; petioles 4–7 mm. long, concave above, articulate, pubescent as the 2–4 mm. long stipules; leaves lanceolate, usually acuminate, attenuate at base, 3.5–10 cm. long, 1.5–4 cm. wide, finely pubescent above, canescent-pubescent beneath, with 5–6 lateral veins; inflorescence paniculate, the axis 8–13 cm. long, canescent-pubescent, the subsessile racemes 2–4 cm. long, 6–8 cm. wide, with triangular bracts about 1.5 mm. long; flowers 4–5 mm. long, the finely puberulent pedicels 1–2 mm. long, outer sepals ovate-lanceolate, obtuse, ciliate, sparsely pubescent beneath, 1-nerved, the two lower one-half connate, about 2 mm. long, the upper one slightly longer; wings blue, to 4.8 mm. long, finely pubescent at obtuse base, ciliate, 3–4-nerved as the little longer keel, this pubescent within, 3-lobed, the obtuse emarginate middle lobe somewhat pubescent on a convex longitudinal line; upper petals almost elongate-spathulate, pubescent; stamens 8, the filaments almost entirely united; ovary strigose puberulent becoming glabrescent, the glabrous cylindric styles geniculate above base; upper stigma lobe 1-tubercled, papillose; drupe ovate, about 4.5 mm. long, glabrescent, reticulate.—Grows in the "ceja de montaña" between 1,800 and 3,200 meters. It is close to *M. Pavoni* Chodat but is not scandent, has obtuse outer sepals, pubescent wings, glabrous styles and the anther is not mucronate. Illustrated, Ferreyra, l.c. *pl. 6.* F.M. Neg. 13106.

Junín: Huacapistana, *Killip & Smith 24253; Weberbauer 2070,* type. Carpapata, above Huacapistana, *Killip & Smith 24421* (type, *M. Killipii*).

Monnina canescens Ferr. Journ. Arnold Arb. 27: 148. 1946.

Seems to be near *M. stipulata* but the slenderer branches obscurely canescent puberulent, petioles 1.5–2 mm. long, leaves lanceo-

late, acute, 2.5–6 cm. long, 11–22 mm. broad, not at all revolute, the 4–5 lateral nerves not prominent; racemes about 10 mm. thick, the puberulent rachis 6.5–12.5 cm. long, the peduncles 3–3.5 cm. long; bracts 1.5–2 mm. long; lower sepals 2–2.5 mm. long, 1-nerved, the upper 3-nerved; wings 5.5–6.8 mm. long; keel glabrous, 3–4-nerved; drupes ovate-oblong, acute, nearly 5–6 cm. long, glabrous.—Illustrated, Ferreyra, l.c. *pl. 5.*

Lima: Along Chillón River, above Obrajillo, *Pennell 14376*, type.

Monnina Clarkeana Chodat, Bull. Herb. Boiss. 4: 246. 1896; 156.

Resembles *M. Lechleriana;* petioles to 7 mm. long, cylindric, pubescent; leaves 2–5.5 cm. long, 6–22 mm. wide, puberulent becoming glabrescent, the lateral nerves obscure; inflorescences many, well-peduncled with leaflet at base, this to 3.5 cm. long, the numerous lax racemes 4–6 cm. long, with almost filiform bracts conspicuous in the upper part; pedicels about 2 mm. long, outer sepals lanceolate-acute, the two lower one-third connate, the upper one 3-nerved to 1.8 mm. long; wings about 3.5 mm. long, the keel slightly longer; upper petals distinctly elongate spathulate; filaments almost two-thirds connate.—Illustrated, Ferreyra, l.c. *pl. 8.*

Amazonas: Without locality, *Mathews 1192*, type.

Monnina conferta R. & P. Syst. Veg. 173. 1798; 147. *M. myrtilloides* DC. Prodr. 1: 339. 1824.

Shrub several to 18 dm. high, the erect stems, petioles and leaves beneath more or less pubescent or becoming glabrescent, the striate branches corymbose; petioles 1.5–2.4 mm. long, concave above, convex beneath; leaves usually elliptic, rarely more or less lanceolate, obtuse, 11–45 mm. long, 4–14 mm. wide, sometimes revolute, with 4–5 inconspicuous lateral veins; peduncles 6–11 mm. long, the simple terminal conical racemes about 1 cm. wide, the rachis 3–10 cm. long, pubescent, with triangular concave acute ciliate 1-nerved bracts, to 1.4 mm. long, pubescent beneath; flower 5–6 mm. long, the finely pubescent pedicels about 1 mm. long; outer sepals ovate, obtuse, ciliate, pubescent beneath, the two lower 2–2.6 mm. long, almost two-thirds connate, 3-nerved, the upper one about 3 mm. long, 5–7-nerved; wings deep blue, 5.2–6 mm. long, 4–5-nerved, ciliate, usually glabrous at least beneath; keel yellow to 6.5 mm. long, pubescent within, 4–5-nerved, 3-lobed, the middle lobe obtuse, emarginate; upper petals short, narrow, pubescent; stamens 8,

filaments almost entirely united; ovary oval, elliptic, glabrous as the cylindric style, this medially geniculate; upper stigma lobe 1-tubercled, papillose; drupe elliptic, 4.5–7 mm. long, glabrous, reticulate.—*Weberbauer 5488* shows a certain pubescence beneath the wings. Chodat, Bot. Jahrb. 42: 102. 1908, referred the very briefly described species of DeCandolle here, apparently correctly. The species is found between 2,500 and 3,700 meters. Illustrated, Ferreyra, l.c. *pl. 5*. F.M. Neg. 7977.

Cajamarca: Cutervo, *Ferreyra 775; 797; 829*. Cutervo to Cochabamba, *Ferreyra 845; 853*. Summit of Gavilan, *Ferreyra 3299; 3314*. Pass south of Conchán, Prov. of Chota, *Stork & Horton 10064*. —Ancash: Chiquian, Prov. of Bolognesi, *Ferreyra 5673*.—La Libertad: Near Huamachuco, *Ferreyra 3004*. Cachicadan, Prov. Santiago de Chuco, *Stork & Horton 9955*.—Huánuco: Huánuco to Pampayacu, *Kanehira 244*. Mito, *1514*. "Tambo nuevo," *Pavón*, type.—Junín: Ocopa, *Killip & Smith 21977*. Near Huancayo, *Killip & Smith 23348; Soukup 1982*.—Huancavelica: Quebrada south of Salcabamba, Prov. Tayacaja, *Stork & Horton 10298*.—Ayacucho: Above Yanamonte, Tambo to Apurímac, *Weberbauer 5659*. Totorabamba, Prov. Huamanga, *Weberbauer 5488*. Without locality, *1807; Lagasca 56; Dombey*.

Monnina connectisepala Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 213. 1934; 154. *M. tenuifolia* Chodat, l.c. 212; not Chodat, 1895. *M. stipulata* var. *tenuibracteata* Chodat, l.c. 205.

More or less pubescent shrub becoming glabrescent, the notably striate branches 3–6 mm. thick; petioles 4–8 mm. long, articulate, the conical cylindric glabrescent stipules 2–3 mm. long; leaves usually elliptic, acute or sometimes obtuse, 3–10 cm. long, 1.5–4 cm. wide with 9–10 lateral nerves; rachis of paniculate inflorescence 7–18 mm. long, usually glabrescent, the divaricate lax racemes 3–14 cm. long with ovate or lanceolate acute bracts to 3 mm. long; flowers 5– to nearly 6 mm. long, pedicels to 1.6 mm. long; outer sepals ovate-lanceolate, rarely acutish, the two lower about 2 mm. long, nearly two-thirds connate, glabrate beneath, 1–3-nerved, the longer upper one 5–7-nerved, puberulent beneath; wings dark blue, 5–6 mm. long, ciliate at obtuse base, 3-nerved, the middle nerve prominent, slightly pubescent beneath and sometimes with a few trichomes within; keel yellow, 5–6 mm. long, usually pubescent beneath, 3–4-nerved, 3-lobed; upper petals spathulate, pubescent; stamens 8, the filaments unequally connate; ovary as style glabrous, the latter geniculate

above, base more or less cylindric, the upper stigma lobe with one papillose tubercle; drupe elliptic, more or less margined, 4–8 mm. long, glabrous, reticulate.—Altitudinal range 2,200 to 3,200 meters. Apparently a southern counterpart of *M. Ruiziana*, the branches glabrescent, the leaves larger. Illustrated, Ferreyra, l.c. *pl. 7.*

Cuzco: Pillahuata, Cerro de Cusilluyoc, *Pennell 13977* (type, *M. tenuifolia*); *Pennell 14095*, type; *14022; 14122* (type, *M. stipulata* var. *tenuibracteata*). Laderas de Pillahuata, Prov. of Paucartambo, *Vargas 81;* near Pillahuata, Prov. of Paucartambo, *West 7071.* Distrito Marcachea, Prov. of Paucartambo, *Vargas 11130.* Summit of Huayna Picchú, *West 6430.* Canyon of Cachu-pampa, Araza River, Distrito Marcapata, Prov. of Quispicanchis, *Vargas 9672.*

Monnina cyanea Chodat, Bot. Jahrb. 42: 100. 1908; 159.

Frutescent, much-branched, 5–10 dm. high, the slender branches ashy pubescent with trichomes 0.5–0.7 mm. long; petioles 1–2 mm. long, concave above, with glabrous coriaceous stipules 0.5 mm. long or shorter; leaves lanceolate, somewhat more or less oblanceolate, usually acute, attenuate at base, 2–6 cm. long, 1–2 cm. wide, canescent puberulent with 5–7 lateral nerves; racemes conical to 1 cm. wide, simple, terminal, the peduncle 8–14 mm. long, the pubescent striate rachis 2.5–12 cm. long, the linear-lanceolate bracts to nearly 3 mm. long, 1-nerved, pubescent beneath; flowers 3.5–3.8 mm. long, the pubescent pedicels about 1.2 mm. long; outer sepals free, lanceolate, obtuse, glabrescent, at least beneath, the two lower 1.4 mm. long, 1-(rarely 5-) nerved, the upper one to 2 mm. long, 3–5-nerved; wings deep blue, 3.6–4.2 mm. long, ciliate, slightly pubescent beneath, the somewhat longer yellow keel glabrous within, ciliolate at base, 3-nerved, 3-lobed; upper petals narrow, attenuate, pubescent; stamens 8, the free part of the nearly connate filaments glabrous; ovary densely pubescent with ascending rigid trichomes; style glabrous, geniculate above the base, almost cylindric, the thicker stigma with lower lobe obtuse, the upper with one papillose tubercle; drupe cordiform, flattened, 4.4–4.5 mm. long, very pubescent, acute, emarginate at base, slightly reticulate.—Characterized by its canescent-hirsute branches, flattened and cordiform drupe, terminal and simple racemes. It has been collected between 1,800 and 3,500 meters. Illustrated, Ferreyra, l.c. *pl. 8.* F.M. Neg. 13111.

Cuzco: Chaupichaca, Marcapata Valley, Prov. of Quispicanchi, *Weberbauer 7835.*—Puno: Between Sandía and Cuyocuyo, *Weberbauer 878*, type. Near Limbani, Prov. of Sandía, *Metcalf 30480.*

Monnina decurrens Ferr. Journ. Arnold Arb. 27: 160. 1946.

Small-leaved, shortly pubescent shrub with enodose stem, the branches as the leaves more or less glabrescent, the former only 1.4–2 mm. thick; petioles to 2 mm. long, concave above; leaves decurrent, elliptic, 12–28 mm. long, 5–7 mm. wide, obtuse, revolute, with 5 or 6 faint nerves; racemes simple, conical, 6–8 mm. thick, subsessile, the puberulent rachis to 2.5 cm. long, the ovate 1-nerved bracts to 1 mm. long, puberulent beneath, ciliate; flowers to 5.2 mm. long, the puberulent pedicels 1.5–2.5 mm. long, outer sepals free, triangular, obtuse, puberulent beneath, the two lower about 1.5 mm. long, 3-nerved, the longer upper one 5-nerved; wings 5.6–6 mm. long, more or less acute at base, somewhat puberulent both sides; keel 4.2–5 mm. long, puberulent within, obscurely 3-lobed, 4–5-nerved; upper petals elongate, puberulent; stamens 8, the nearly united filaments glabrous; ovary oblong, puberulent as the distinctly geniculate cylindric style, the upper stigma lobe tuberculate papillose; drupes elliptic, 5–7 mm. long, puberulent, reticulate.—Differs from *M. Vitis-Idaea* Chodat in the enodose stem, larger and conical racemes, 3-nerved lower sepals, pubescent ovary and style, and from *M. peruviana* Chodat in its smaller numerous elliptic leaves and pubescent wings. Illustrated, Ferreyra, l.c. *pl. 9.*

Cajamarca: East of Huancabamba, Prov. Jaén, 2,800 meters, *Weberbauer 6100,* type.

Monnina densecomata Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 209. 1934; 164.

Shrub with striate branches 4–5.5 mm. thick, densely pubescent, with trichomes 0.6–1 mm. long; petioles 3–6 mm. long, almost cylindric, pubescent, the conical stipules to 3 mm. long, hirsute below; leaves elliptic, obtuse, 3.5–7 cm. long, 2–4 cm. wide, early pubescent becoming glabrescent, revolute with 5–6 lateral veins; inflorescence paniculate, the rachis to 12.5 cm. long, striate, pubescent, the subsessile lax racemes conspicuously so, subacute, 7–9 mm. wide, the lanceolate-acuminate lax densely pubescent bracts to 5 mm. long; flowers 4.5–5.5 mm. long, the pedicels about 1 mm. long; outer sepals free, lanceolate, ciliate, pubescent beneath, the two lower to 3.4 mm. long, usually acute and 3-nerved, sometimes 1–2-nerved, the longer upper one obtusish, usually 5- rarely 3-nerved; wings blue, about 5 mm. long, pubescent beneath, 4–5-nerved, ciliate at obtuse base as also the longer yellow keel, this pubescent within,

3–4-nerved, 3-lobed, the obtuse middle lobe slightly emarginate, upper petals spathulate, pubescent; stamens 8, the free part of the almost entirely united filaments glabrous; ovary ovoid, glabrous as the cylindric geniculate style; lower stigma lobe acute, the upper with one papillose tubercle; drupes ellipsoid-acute to 4.6 mm. long, glabrous, reticulate.—Illustrated, Ferreyra, l.c. *pl. 10.*

Cuzco: Paso de Tres Cruces, Cerro de Cusilluyoc, 3,800 meters, *Pennell 13821*, type. Paucartambo, *Soukup 391.*

Monnina divaristachya Ferr. Journ. Arnold Arb. 27: 148. 1946.

Suggests *M. callimorpha* but much less pubescent, the branches glabrescent as the leaves above, these merely puberulent beneath, 5–13.5 cm. long, 1.5 to nearly 5 cm. wide, the lateral nerves 8 or 9; panicles ample, the simple widely divaricate fragile racemes on peduncles 2.5–4.5 cm. long, the rachis 2–2.5 dm. long; bracts filiform to 2.8 mm. long; flowers about 3.5 mm. long, outer sepals more or less lanceolate, glabrous or puberulent beneath, the two lower two-thirds connate, 1.4–1.8 mm. long, 3-nerved, the slightly longer upper one 5-nerved; wings about 4 mm. long, acute at base, pubescent beneath, 3-nerved as the 3-lobed keel; filaments more or less connate, the anthers mucronate; ovary shortly puberulent at base or glabrous as the finally geniculate and horizontal style, the upper stigma lobe tuberculate, papillose; drupes elliptic, 5.5–7.5 mm. long, glabrous, conspicuously reticulate.—The broad panicle with lax racemes is striking; confined to the "ceja de montaña" between 1,600 and 2,800 meters. Illustrated, Ferreyra, l.c. *pl. 6.*

Huánuco: Carpish, Prov. of Huánuco, *Ferreyra 4120.*—Junín: Pichis Trail, Enenas, *Killip & Smith 25778*, type. Pichis Trail, *Killip & Smith 25427.*

Monnina filifolia Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 198. 1934; 134.

Herbaceous annual in general like *M. amarella* but with sessile linear-acuminate or sometimes acute leaves 2–7 cm. long, 1.5–5 mm. wide, and well-peduncled racemes, the axis usually 2–4 dm. long or longer; flowers 3–3.5 mm. long, the pedicels 0.8–1 mm. long; upper sepal ciliate; wings 3.2–3.5 mm. long; upper petals conspicuously pubescent, the sheath slightly so at apex; style somewhat longer than ovary, the two auricles conspicuous; stigma more or less denticulate.—Very close to *M. graminea*, the type not seen, but

differs in the filiform lower leaves, the conspicuously puberulent samara and the completely united filaments. Illustrated, Ferreyra, l.c. *pl. 1.*

Huancavelica: Valley of the Mantaro River, below Colcabamba, Prov. of Tayacaja, *Weberbauer 6454,* type. Mejorada, *Stork & Horton 10909.*

Monnina glabrifolia Ferr. Journ. Arnold Arb. 27: 142. 1946.

Shrub 2 meters high, the glabrous, finely striate branches 2–7 mm. thick; petioles 2–3 mm. long, glabrous; leaves lanceolate, long-attenuate to base, acute or shortly acuminate, 4.5–14 cm. long, 2–6 cm. broad, with 9 or 10 lateral nerves; racemes more or less conical, 5–7 mm. thick, the shortly puberulent rachis 3.5–23 cm. long, the peduncle 1.5–4.5 cm. long, the lanceolate 1-nerved puberulent bracts 4.5–6.5 mm. long; flowers 4.2–4.6 mm. long, the somewhat puberulent pedicels about 1.5 mm. long; outer sepals lanceolate, ciliate, puberulent, the two lower nearly 3 mm. long, obtuse to two-thirds connate, 5-nerved, the upper sepal smaller, 7-nerved; wings about 5 mm. long, rather obtuse at base, 3–4-nerved, ciliate, pubescent beneath, the little longer keel glabrous, its middle lobe emarginate, 3–4-nerved, shortly ciliate; upper petals shortly elongate, pubescent; stamens 8, the nearly united filaments glabrous; ovary densely pubescent, the glabrous cylindric style geniculate, the upper tubercled stigma lobe papillose; drupes cordate, 4.5–6 mm. long, shortly alate, conspicuously pubescent, reticulate-venose.—Related to *M. andina* but has much larger acuminate leaves, the racemes with crowded and larger bracts; it is also close to *M. Lechleriana* from which it differs sharply in the terminal and simple racemes, the pubescent ovary and otherwise. Illustrated, Ferreyra, l.c. *pl. 4.*

Puno: Santo Domingo to Chabuca mine, Prov. Carabaya, 1,900 meters, *Metcalf 30661,* type.

Monnina graminea Chodat, Bot. Jahrb. 42: 103. 1908; 135.

Resembles *M. pterocarpa* and its relatives, particularly *M. filifolia,* but the lower leaves lanceolate or linear-lanceolate, acute mucronate, pubescent, 2.5–4 cm. long, 3–8 mm. wide; flowers 2–3 mm. long, nerves of wings fan-shaped; keel hemispherical, obtusely 3-lobed, upper petals short, broad; filaments free above; samara 2–3 mm. long, glabrous.—Type not seen. F.M. Neg. 13117.

Cajamarca: Below San Miguel, 2,200 meters, Prov. Hualgayoc, (*Weberbauer 3919*). Above Cajamarca, 2,700 meters, *Ferreyra 3183.* —Libertad: Vicinity of Samne, 1,600 meters, *Ferreyra 3087.*

Monnina herbacea DC. Prodr. 1: 340. 1824; 135. *M. polygonoides* Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 200. 1934.

Herbaceous annual, one to several dm. high, from a curved usually branched root, the nearly erect striate stem with more or less corymbose pubescent branches from the base; petioles to 1.5 mm. long, pubescent; leaves lanceolate, rarely oblanceolate-elliptic, attenuate at base, obtuse, usually 1–4 cm. long, 3–12 mm. wide, becoming glabrescent, with 5 or 6 lateral veins; racemes conical, 7–8 mm. wide, shortly peduncled, the axis about 2–8 cm. long, finely pubescent with conspicuous glabrous filiform bracts about 2 mm. long; flowers 3.5–4.2 mm. long, subsessile; outer sepals free, lanceolate, ciliate, the two lower about 1.5 mm. long, usually 3-nerved, the upper one 2–2.4 mm. long, 5-nerved; wings purple, 3.5 to nearly 5 mm. long, obovate, 3-nerved, ciliate, equaled by the orbicular plicate 4-nerved ciliate keel, its middle lobe obtuse, emarginate; upper petals elongate, spathulate, pubescent within; stamens 8, the filaments united two-thirds their length, glabrous, the anthers emarginate; ovary densely pubescent with short rigid trichomes, the longer glabrous style geniculate above the base, thicker at apex; upper lobe of stigma 1-tubercled; fruit somewhat samaroid, cordiform, about 4 mm. long, conspicuously pubescent, usually acute, emarginate at base, the wing inconspicuous, the body rugose-reticulate.—The type labels indicate Lima as origin of the species, but here, as often for Dombey and Lagasca material, it was probably collected in the Departments of Huánuco and Junín, between 2,100 and 2,800 meters. Illustrated, Ferreyra, l.c. *pl. 1.* F.M. Neg. 7974.

Huánuco: Ambo, *3181* (type of *M. polygonoides*).—Junín: Huariaca, *3116*.—Libertad: Trujillo to Huamachuco, 2,900 meters, *Ferreyra 2991*.—Without locality and date, *Dombey 625*. Without locality, 1862, *Mathews;* "ex Lima," 1807, *Lagasca 53* (photograph of type).

Monnina Herrerae Ferr. Journ. Arnold Arb. 27: 165. 1946.

Pubescent shrub, the ligneous branches about 3 mm. thick, conspicuously pilose, with yellowish lax trichomes 0.6–0.8 mm. long; petioles 4.5–7 mm. long, puberulent; leaves lanceolate, long-attenuate to base, acute, 4.5–9 cm. long, 1.5–3 cm. wide, more or less puberulent above, flavescent puberulent beneath, the prominent midnerve conspicuously so, the lateral nerves 6 or 7; racemes simple or aggregate, somewhat acuminate, 7–10 mm. thick, the puberulent rachis about 7 cm. long, the peduncle 5–12 mm. long, the linear-lanceolate

bracts 4–5 mm. long, puberulent beneath; flowers about 5 mm. long, the pedicels about 1 mm. long; outer sepals free, lanceolate, acute, concave, ciliate, underneath puberulent, the two lower about 3 mm. long, 1-nerved, the slightly longer upper one 3–5-nerved; wings 5–5.6 mm. long, 4–5-nerved, glabrous as the scarcely longer keel, this 3-lobed, 3–4-nerved; upper petals spathulate, puberulent both sides; stamens 8, anthers subsessile, free part of filaments glabrous; ovary glabrous as the geniculate style, upper stigma lobe tubercle papillose, the lower acute.—Related to *M. Vargasii* Ferr. from which it is distinguished by its conspicuously woody branches, its smaller acute leaves, its one-nerved lower sepals and its glabrous ovary, and to *M. pachycoma* Chodat, from which it differs in its larger acute leaves and smaller outer sepals, these 1-nerved and densely pubescent beneath. The name honors the late distinguished Peruvian botanist Fortunato L. Herrera. Illustrated, Ferreyra, l.c. *pl. 10.*

Apurímac: Río Pinkos to Río Apurímac, 3,400 meters, *Weberbauer 5864*, type.

Monnina hirtella Ferr. Journ. Arnold Arb. 27: 158. 1946.

Ashy pubescent shrub to 1.5 meters high, the branches 2.5–5 mm. thick, petioles 2–5 mm. long; leaves lanceolate, long-attenuate to base, acuminate, 3.5–11 cm. long, 1–3.4 cm. wide, the lateral nerves 6 or 7; racemes simple, terminal or axillary, 7–9 mm. thick, the puberulent striate rachis 3.5–13 cm. long, the peduncle often 1–3 cm. long; bracts lanceolate, acute, 1– nearly 2 mm. long, puberulent beneath, 1-nerved; flowers 4–5 mm. long, the puberulent pedicels about 1.3 mm. long, outer sepals free, rather lanceolate, concave, obtuse, ciliate, puberulent beneath, the two lower 2 mm. long, 3-nerved, the longer upper one 5-nerved; wings to 5 mm. long, pubescent basally beneath, 3-nerved as the 3-lobed keel, this nearly as long or longer, puberulent within, obtusely 3-lobed; upper petals elongate-spathulate, strongly pubescent both sides, the trichomes 1.2–1.5 mm. long; stamens 8, the nearly completely connate filaments glabrous as the ovary and style, the former oblong, the latter notably geniculate, cylindric; lower stigma lobe acute, upper tuberculate papillose; drupes elliptic, 5.5–7 mm. long, glabrous, reticulate.—Suggests *M. ligustrifolia* but leaves almost twice as large and acuminate and the axis of the racemes longer, very pubescent, and without acute ovate bracts at its apex; less closely related to *M. salicifolia* from which it differs in the larger and acuminate leaves, longer petiole and pubescence. Illustrated, Ferreyra, l.c. *pl. 8.*

San Martín: Zepelacio, near Moyobamba, 1,100 meters, *Klug 3337*, type. San Roque, *Williams 7105*.

Monnina huallagensis Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 223. 1934; 141.

Very close to *M. longibracteata* Chodat, from which it differs in the rigid bracts, the acuminate leaves, the stamens with the free upper part of the filaments pubescent and the mucronate anthers; leaves to 12 cm. long, nearly 4 cm. wide, usually acuminate; petioles 2–4 mm. long, with pubescent stipules 1–1.4 mm. long; bracts linear, not involute, 3–5 mm. long; pedicels to 2 mm. long, sepals about two-thirds united, sometimes ciliate; wings to 4.6 mm. long, more or less pubescent beneath; drupe ovate, 4–6 mm. long, glabrous, conspicuously reticulate.—Also related to *M. macrosepala* Chodat but rachis to 3 dm. long, the flowers not crowded, leaves with 7–8 lateral veins, outer sepals 1-nerved, anthers mucronate. The var. *pachyphylla* Chodat, l.c., has stouter branches, glabrous reticulate-veined leaves and much shorter rachis. Illustrated, Ferreyra, l.c. *pl. 3*.

Huánuco: Pampayacu, *Kanehira 290*. Huallaga, 1,600 meters, *Weberbauer 6805*, type.

Monnina Lechleriana Chodat, Bull. Herb. Boiss. 3: 129. 1895; 155.

Frutescent, the branches hirsute toward the tips, striate, 3–4 mm. thick, stipules cylindric to 2 mm. long; leaves lanceolate-elliptic, acute, 6–8.5 cm. long, 2–3 cm. wide, somewhat revolute, glabrescent; inflorescence paniculate, narrow, the racemes and flowers approximate; bracts deciduous, obscure; flowers 4–4.5 mm. long, the slightly pubescent pedicels about 1.5 mm. long; outer sepals ovate-lanceolate, ciliate, the two lower obtuse, 1.5 mm. long, one-half connate, 1-nerved, glabrous beneath, the upper one 2.3 mm. long, acute, puberulent beneath, 5–7-nerved; wings about 4 mm. long and wide, glabrous, 5-nerved, equaled by the somewhat pubescent 4- or 5-nerved keel; upper petals short-oblong, puberulent; stamens 8, the filaments connate nearly one-third, the free part glabrous; ovary and style glabrous, the latter geniculate cylindric; upper stigma lobe with one papillose tubercle.—Illustrated, Ferreyra, l.c. *pl. 8*. F.M. Neg. 13120.

Puno: Tabina, *Lechler 2072*, type.

Monnina ligustrifolia HBK. Nov. Gen. & Sp. 5: 417. 1823; 156.

More or less puberulent shrub becoming glabrescent; petioles 1.5–3 mm. long, semi-terete; leaves lanceolate, acute, 3.5–6.5 cm. long, 1–2 cm. wide, the veins more or less reticulate; racemes simple, terminal or axillary, the slightly pubescent rachis 3–6.5 cm. long, with conspicuous ovate acute ciliate bracts; flowers 4 mm. long, the pedicels about 1.7 mm. long; outer sepals free, ovate, the two lower 1.5 mm. long, obtuse, glabrous beneath, 5-nerved, the upper one 2 mm. long, pubescent beneath, acute, 7-nerved; wings 4 mm. long, 3–4-nerved, glabrous beneath, ciliate at base, the scarcely as long keel pubescent within, 3-nerved, 3-lobed; upper petals short, puberulent; stamens 8, the filaments almost entirely connate, the free part glabrous; ovary ellipsoid, glabrous; style early straight, becoming geniculate above, cylindric, the lower lobe of the thicker stigma obtuse, the upper lobe with one papillose tubercle; drupe ovoid, to 4.8 mm. long, glabrous, reticulate.—Characterized by the simple terminal or axillary racemes with conspicuous ovate acute bracts. The measurements of the leaves are taken from the photograph. Illustrated, Ferreyra, l.c. *pl. 8.* F.M. Neg. 34919.

Piura: Ayavaca, *Bonpland 3491*, type.

Monnina longibracteata Chodat, Bull. Herb. Boiss. 3: 130. 1895; 140.

Frutescent, the branches 5 mm. thick, more or less glabrescent as the leaves, these lanceolate or elliptic, sometimes linear-lanceolate, attenuate at base, acute or rarely acuminate, 8–9 cm. long, about 2.5 cm. wide, with 8 or 9 lateral veins; petioles 4–8 mm. long, racemes elongate, terminal or axillary, rather open, the conspicuous filiform bracts involute at tip, 1-nerved, 5–6.5 mm. long; flowers 3.6–5 mm. long, the finely pubescent pedicels about 1.5 mm. long; outer sepals lanceolate, glabrous, the two lower 2.5 mm. long, almost one-half united, the solitary nerve prominent, the upper sepal 3-nerved to 3 mm. long; wings about 4 mm. long, obtuse at base, 3–4-nerved, sometimes with a few trichomes on the lower part; keel 3 mm. long, pubescent within except the margin, 3–4-nerved, 3-lobed, the middle lobe obtuse, emarginate; upper petals oblong, attenuate, pubescent within; stamens 8, the filaments almost entirely united; ovary glabrous as the cylindric style, this geniculate above the base; upper stigma lobe with one papillose tubercle; fruit unknown.—Type probably from northern Peru where Mathews lived for several years.

The var. *ainensis* Chodat, Bull. Soc. Bot. Genève sér. 2. 25: 222. 1934, has acuminate leaves 4–17 cm. long, 1–6.5 cm. wide; racemes to 3.3 dm. long, the outer sepals ciliate, the lower 3-nerved, the wings strongly pubescent beneath; ovary somewhat pubescent. Illustrated, Ferreyra, l.c. *pl. 3.* F.M. Neg. 34921.

Amazonas(?): Without locality, *Mathews 2075*, type.—Ayacucho: Aína, between Huanta and Apurímac River, *Killip & Smith 23188*, type, var.

Monnina Macbridei Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 199. 1934; 137.

Similar to *M. ramosa* but completely herbaceous and simple or few-branched, the linear or narrowly lanceolate acute leaves 14–45 mm. long, 1.5–5 mm. wide, not at all revolute; peduncles 2–6 cm. long, the axis glabrescent, with filiform inconspicuous bracts 1.5–2 mm. long, the outer sepals glabrous, 1-nerved, the wings purple, 3- or 4-nerved, the straight style almost cylindric and the samara glabrous.—Known from 2,100 to 3,355 meters. Illustrated, Ferreyra, l.c. *pl. 2.*

Arequipa: Chachani Mountain, north of Arequipa, *Hinkley & Hinkley 18;* Arequipa, *Pennell 13167*, type. Tingo, *Pennell 13110.*

Monnina macrosepala Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 218. 1934; 145.

Frutescent, often a meter or 2 high, the terete branches about 6 mm. thick, lightly pubescent, becoming glabrescent; petioles 2–4 mm. long, pubescent; leaves linear-lanceolate, attenuate at base, mostly acuminate 5.5–12.5 cm. long, 12–28 mm. wide, glabrescent, with 9 or 10 lateral nerves; racemes cylindric, 4–5 mm. wide, shortly peduncled, simple, terminal, the pubescent rachis 6–15 cm. long, the bracts linear, 3–6 mm. long, lax, ciliate, 1-nerved; flowers 4.2–4.8 mm. long, the glabrescent pedicels about 1 mm. long; outer sepals lanceolate, glabrous beneath, the two lower about 4.5 mm. long, two-thirds connate, 5-nerved, ciliate, the upper one 4.5–5 mm. long, rarely ciliate, sometimes obtuse, 7–9-nerved; wings pubescent beneath to 5 mm. long, 4–5-nerved as the slightly shorter keel, this pubescent within, the middle lobe obtuse, emarginate; upper petals elongate-spathulate, pubescent; stamens 8, almost entirely united, the free part pubescent, the anthers more or less mucronate; ovary glabrous as the cylindric style, this geniculate above the base; upper stigma lobe 1-tubercled, papillose.—The var. *latifolia* Chodat, l.c.

page 219, differs in its broad leaves (to about 6 cm. wide), longer petioles (4–6 mm.), upper sepal at most 4.4 mm. long and the orange keel.

Junín: Chanchamayo Valley, *Schunke 487*, type. Huacapistana, *Killip & Smith 24515*. San Ramón, *Killip & Smith 24754; 24765*. La Merced, along sunny stream, 600 meters, *5410* (type var.).

Monnina macrostachya R. & P. Syst. Veg. 173. 1798; 139. *Polygala lanceolata* Poir. Encycl. 5: 498. 1804. *M. lanceolata* DC. Prodr. 1: 339. 1824. *M. macrostachya* var. *pumila* Gray, U. S. Expl. Exped. Bot. 1: 107. 1854. *M. Weberbaueri* var. *elongata* Chodat, Bot. Jahrb. 42: 103. 1908; var. *pachyantha* Chodat, l.c.; var. *maxima* Chodat, l.c.

Similar to *M. Weberbaueri* but the leaves usually acuminate, petioles 1–2.5 mm. long; peduncles to 8 cm. long, the axis to 2 dm. long or longer, the bracts usually 2 mm. long or longer; flowers 4–6 mm. long, the pedicels about 1 mm. long, lower sepals 2–2.4 mm. long, rarely 3-nerved, the upper one 3–5-nerved; samara ovate, 3–5 mm. long, rarely strigillose, the wing 0.6–1 mm. wide, deeply emarginate base and apex.—Type of *P. lanceolata* not seen and since the varieties of Chodat come from within this area it is presumed that they are referable here rather than to the related *M. Weberbaueri* and *M. arenicola*, which are strictly confined to the lomas. Type locality "Cercado et Chancay." Altitudinal range 1,300 to 3,300 meters. Illustrated, Ferreyra, l.c. *pl. 3*. F.M. Neg. 34917 (*M. lanceolata*).

Huánuco: Mito, *1548*.—Lima: Canta, *Pennell 14343*. Obrajillo, *Pennell 14372*. Below Obrajillo, *Pennell 14436; Wilkes Exped.*, type of var. *pumila; Pennell 14373*. Yanahuanca, *1168*. Cajatambo Prov., *Stork 11451*. Above Santa Eulalia, *Goodspeed 33016*. Matucana, *88, 311; Goodspeed 11332; Stork & Horton 9143*. Valley of Lima, *Mathews 394*.—Ancash: Vicinity of Chiquian, Prov. of Bolognesi, *Ferreyra 5677; 5681*.—Libertad: Otuzco to Huamachuco, *Ferreyra 2988*.—Moquehua: Estuquina, *Weberbauer 7451*. Carumas, *Weberbauer 7301*. Without locality, *Mathews 1001; Dombey*.

Monnina marginata Presl, Rel. Haenk. 2: 102. 1835; 144. *M. laurifolia* Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 208. 1934. *M. petiolaris* Chodat, l.c. 214. *M. petiolaris* var. *elliptica* Chodat, l.c. 215.

A slender tree sometimes attaining 4.5 meters with crown to 1 meter in diameter, the many striate glabrous branches to 1 cm.

thick; petioles 2–10 mm. long, articulate, almost cylindric, becoming glabrescent; leaves lanceolate, attenuate at base, acute, rarely more or less obtuse, 2.5–10 cm. long, 11–28 mm. wide, glabrescent above, slightly pubescent beneath, with 6–8 lateral veins; racemes shortly peduncled, simple, terminal, conspicuously corymbose, conical, 8–9 mm. wide, the axis 2–3 cm. long, finely pubescent with inconspicuous triangular bracts about 1 mm. long; flowers 4–5 mm. long; pedicels 0.5–1.8 mm. long, slightly pubescent; outer sepals ovate-triangular, ciliate, obtuse, pubescent beneath, the two lower one-half united, 1-nerved, about 2 mm. long, the upper one 2–2.4 mm. long, 3-nerved; wings deep blue, 4.5–5.5 mm. long, obovate, more or less obtuse and ciliate at base, 5-nerved, pubescent beneath, equaled by the yellow keel, this glabrous at margin, 3–4-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals spathulate, densely pubescent; stamens 8, nearly united, glabrous; ovary elliptic, conspicuously pubescent, the upper longitudinal line with rigid larger trichomes; style glabrous, medially geniculate, cylindric, the upper stigma lobe 1-tubercled, papillose; drupe ovate, 4–6 mm. long, half as wide, glabrous, reticulate.—Closely related to *M. conferta* R. & P. but different in the larger lanceolate leaves, conspicuously corymbose racemes, 1-nerved sepals, pubescent wings and ovary. Ranges between 2,800 and 2,900 meters. Illustrated, Ferreyra, l.c. *pl. 4.* F.M. Neg. 13109.

Huánuco: Pampayacu to Huánuco, *Kanehira 190.* Carpish, *Stork & Horton 9908; Ferreyra 1206; 1710; 1716; 2345.* Tambo de Vaca, *4908* (type, *M. petiolaris* var. *elliptica*). Panao, *3620* (type, *M. petiolaris*). South of Mito, *1855* (type, *M. laurifolia*). In mountains of Huánuco, *Haenke*, type.

Monnina Mathusiana Chodat, Bull. Herb. Boiss. 3: 134. 1895; 161. *M. scandens* Chodat, Bot. Jahrb. 42: 98. 1908.

Scandent, with slightly hirsute branches; petioles 3–4 mm. long; leaves lanceolate, acute or more or less acuminate, 3.5–8 cm. long, 1–3 cm. wide, becoming glabrescent above, the lateral nerves 4 or 5; inflorescence paniculate, the pubescent rachis to 2 dm. long, the numerous racemes lax, the hirsute bracts filiform; flowers to 4.5 mm. wide, subglobose on short pedicels; outer sepals free, ovate-triangular, ciliate, slightly concave, 1–3-nerved; wings three times larger, ovate, obtuse; keel yellowish, 3-lobed, the lobes acute; upper petals fan-like, glabrescent, the almost entirely united filaments pubescent; ovary glabrous; style straight, becoming geniculate, the lower

stigma lobe denticulate, the upper with 1 papillose tubercle.—I have seen no material of this species other than photographs. F.M. Negs. 32381; 13138 (*M. scandens*).

Amazonas: Chachapoyas, *Mathews 1190*, type.—Cajamarca: Chugur, Hualgayoc, 2,700 meters, *Weberbauer 4072* (type, *M. scandens*).

Monnina membranifolia Ferr. Publ. Mus. Hist. Nat. "Javier Prado" (Universidad Nacional Mayor de San Marcos), *Ser. B.* Botanica 1: 2. 1948.

Small tree sometimes 3.5 meters high, the trunk at base to 6 cm. in diameter, the many striate, shortly puberulent branches 2–4 mm. thick, petioles 1.5–3 mm. long, puberulent; leaves elliptic, more or less lanceolate, long-attenuate at base, acute or obtuse, 2.5–9 cm. long, mostly 1.5–4.5 cm. wide, membranous, the lateral nerves 6 or 8; racemes simple, terminal or axillary, more or less conical, 10–12 mm. thick, the rachis 3.5–14 cm. long, puberulent, the peduncle 1–4 cm. long; bracts ovate, acute, pubescent beneath, 1.5–1.8 mm. long; flowers 6–7 mm. long, the puberulent pedicels to 1.6 mm. long; outer sepals rather lanceolate, concave, pubescent beneath, 3-nerved, the lower two to 2.6 mm. long, one-half connate, obtuse, the upper 3.5 mm. long, acute; wings about 6.5 mm. long, 5-nerved, the middle nerve prominent, puberulent beneath, the slightly longer keel glabrous, 3-lobed, 4-nerved; upper petals slender, densely pubescent both sides; stamens 8, the short free part of the filaments glabrous as the oblong ovary and the finally geniculate and horizontal style, this more or less cylindric; upper stigma lobe tuberculate, papillose, the lower acute; drupes ovate-oblong, 9–12 mm. long, glabrous.—It differs from *M. canescens* Ferr. principally in its large elliptic glabrescent membranous leaves with 6–8 lateral nerves, and in the 3-nerved outer sepals and large fruit. Illustrated, Ferreyra, l.c. *pl. 1.*

Lima: Llacshishi, Surco, 3,200 to 3,300 meters, *Ferreyra 700*, type, herb. Ferreyra, Isotype, Herb. Mus. Hist. Nat. "Javier Prado" de la Universidad Nacional Mayor de San Marcos de Lima.

Monnina menthoides Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 219. 1934; 143.

Canescent-tomentose, shrubby, the branches 2.5–3 mm. thick, the leaves lanceolate, attenuate at base, acute, sometimes mucronate, 3–4 cm. long, 8–9 mm. wide, more densely pubescent beneath than above, sinuate denticulate; petioles 3 mm. long; racemes simple,

terminal, 6–8 cm. long, the axis 6–12 cm. long, densely hirsute, the linear bracts pubescent beneath; flowers 5 mm. long, the pubescent pedicels 1 mm. long; outer sepals ciliate, the two lower united; wings more or less orbicular, slightly clawed, ciliate; upper petals linear-spathulate, pubescent; filaments more or less united; ovary pubescent; styles geniculate; samara cordate, 5 mm. long and wide, pubescent, the apex slightly emarginate, the reticulate body canescent.—Description compiled, the type not seen; it appears to be closely related to *M. andina* Chodat and *M. cyanea* Chodat, the former much less pubescent and the latter with free sepals.

Cuzco: Marcapata, Prov. Quispicanchis, (*Weberbauer 7786*, type).

Monnina ovata Ferr. Journ. Arnold Arb. 27: 151. 1946.

Scandent shrub with woody glabrous prominently striate branches 2–5 mm. thick and ovate obtuse glabrous leaves 3.2–8.6 cm. long, 1.6–3.5 cm. broad, the lateral nerves 9–10; petioles 4–6 mm. long, concave above; panicles ample, much-branched, the lax racemes puberulent or glabrous, 8–10 mm. thick, the glabrous rachis 12–16 cm. long with slender peduncle 4–4.5 cm. long; bracts inconspicuous; flowers globose, 4.5–5.5 mm. long, the shortly puberulent peduncles about 1 mm. long; outer sepals lanceolate, obtuse, concave, ciliate, the two lower to 2.4 mm. long, one-half connate, 3-nerved, glabrescent beneath, the upper sepal 5-nerved to 3 mm. long, puberulent beneath; wings 5–5.8 mm. long, 3–4-nerved, conspicuously ciliate puberulent beneath, equaled by the 3-lobed keel, this puberulent within, the lateral lobes notably ciliate; upper petals dilated or spathulate, puberulent both sides; stamens 8, the glabrous filaments nearly entirely united; ovary ovate, puberulent, the glabrous style geniculate near the base, upper stigma lobe tuberculate, papillose, the lower rather obtuse; drupes elliptic, 5.5–7 mm. long, glabrous, reticulate.—Seems closely related to *M. Ruiziana* Chodat but scandent, with glabrous striate branches, obtuse leaves and pubescent ovary. Illustrated, Ferreyra, l.c. *pl. 6*.

Huánuco: Playapampa, 2,700 meters, *4493*, type.

Monnina pachycoma Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 220. 1934; 166.

Character in general that of *M. Herrerae;* trichomes on branches 0.8–1.2 mm. long, petioles 3.5–4.5 mm. long, the stipules densely hirsute; leaves 2–6 cm. long, 8–21 mm. wide, obtuse, rarely slightly mucronate; racemes almost conical, acute, 11–16 mm. wide, the

rachis 3.5–10 cm. long, the bracts to 6.5 mm. long; flowers 6– nearly 7 mm. long, the pedicels about 1.5 mm. long; outer sepals to 7 mm. long, glabrous beneath, the apex strongly involute, the two lower 3-nerved; keel 6–8 mm. long; drupes ellipsoid to 9 mm. long, glabrous, more or less reticulate.—The conspicuous outer sepals with their strongly involute apex characterize this species. Illustrated, Ferreyra, l.c. *pl. 10.*

Cuzco: Paso de Tres Cruces, Cerro de Cusilluyoc, 3,600 meters, *Pennell 13834*, type; *13823*. Acanacu Pass, Prov. of Paucartambo, *West 7036*.

Monnina Pavoni Chodat, Bull. Herb. Boiss. 3: 132. 1895; Bot. Jahrb. 42: 102. 1908; 152. *M. huacachiana* Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 210. 1934.

Character in general that of *M. polystachya* but the conspicuously pubescent branches, these 3–7 mm. thick, becoming more or less glabrescent, the rigid trichomes at most 1 mm. long; petioles almost cylindric, with leaflets in the axils; leaves less pubescent above, 3–9 cm. long, 12–30 mm. wide; panicle to nearly 2.5 dm. long, the numerous racemes 7–19 cm. long on peduncles 12–24 mm. long, the bracts 3–3.6 mm. long; pedicels to 1.8 mm. long; outer sepals more or less acuminate, the two lower 1.8–2.4 mm. long, one-half connate, the upper 3-nerved; wings with 3 or 4 nerves; filaments almost entirely united, the anthers mucronate; style pubescent near base; drupes 4.2–5.4 mm. long.—Has been found between 2,000 and 3,000 meters. Illustrated, Ferreyra, l.c. *pl. 7.*

Huánuco: Huacachi, Estacion near Muña, *3885; 4124* (type of *M. huacachiana*). Panao, *3622*. Prov. of Pachitea, *Ferreyra 1797*. Locality not given, *Pavón*, type.

Monnina peruviana Chodat, Bull. Herb. Boiss. 3: 133. 1895; 161.

Frutescent, the many early puberulent branches nodose, 5–7 mm. thick; petioles 2–6 mm. long; leaves more or less decurrent, linear-lanceolate, usually acute, 8–12 cm. long, 16–26 mm. wide, puberulent, with 7–8 lateral nerves; racemes more or less cylindric, acute, 5–7 mm. wide, simple, axillary or terminal, subsessile, the rachis 3–7 cm. long, densely pubescent, with ovate-triangular bracts to nearly 3 mm. long, pubescent beneath; flowers to 4.5 mm. long, the pubescent pedicels more than 1 mm. long; outer sepals free, ovate-lanceolate, obtuse, ciliate, glabrous beneath, the two lower about 2 mm. long, 3-nerved,

the longer upper one 5-nerved; wings deep blue, about 4.5 mm. long, ciliate, glabrous within, 5–6-nerved; keel shorter, densely pubescent within, ciliolate at base, almost obtuse, 3-lobed; upper petals spathulate, pubescent; stamens 8, the almost entirely united filaments glabrous; ovary ellipsoid, densely pubescent with rigid ascendant trichomes above; style medially geniculate, very pubescent, cylindric; lower stigma lobe obtuse, upper with one papillose tubercle.—Illustrated, Ferreyra, l.c. *pl. 5.*

Amazonas: Near Chachapoyas, *Mathews,* type.

Monnina pilosa HBK. Nov. Gen. & Sp. 5: 419. 1823; 163.

Tree, the branches densely hirsute, terete; petioles 3.5–5 mm. long, semi-terete, pubescent; leaves oblong, attenuate at base, more or less obtuse, sometimes acuminate, 7.5–9.5 cm. long, 3–4 cm. wide, densely pubescent with 7–8 lateral veins; panicles more or less corymbose, the axis hirsute, lax, the bracts pubescent; flowers shortly pedicellate; outer sepals free, ovate, ciliate, concave, the two lower 3-nerved, acute, upper one 5-nerved, obtuse; wings twice as large as sepals, fan-like, 7-nerved, glabrous; keel nearly oblong, pubescent within, glabrous beneath; upper petals short, glabrous; stamens 8, the filaments united below, the anthers ovate, obtuse; ovary ovoid, glabrous as the geniculate style, lower stigma lobe denticulate, the upper with one papillose tubercle.—Description adapted from the original and also from fragments of the type. The var. *glabrescens* Ferr. is sparsely pilose, the more or less spathulate, acutish leaves to 16.5 cm. long. Illustrated, Ferreyra, l.c. *pl. 10.* F.M. Neg. 34927.

Piura: Ayavaca, *Bonpland 3490,* type. Canchaque, Prov. of Huancabamba, *Stork 11425,* type, var. Above Canchaque, *Ferreyra 3124* (var. *glabrescens*). Ecuador.

Monnina polystachya R. & P. Syst. Veg. 171. 1798; 151.

Densely puberulent scandent shrub attaining 4.5 meters, the branches 4–5 mm. thick, yellowish pubescent, with trichomes 1.2–2(2.5) mm. long; petioles 2–6 mm. long, basally articulate, concave above; leaves lanceolate, attenuate at base, usually acute, 2.5–7.5 cm. long, 1–3.5 cm. wide; inflorescence paniculate, the rachis 7–12 cm. long, the 4–7 subsessile lax racemes 3–10.5 cm. long, 8–10 mm. wide, with lanceolate acuminate pubescent 1-nerved bracts 2–3.2 mm. long; flowers 4.6–5 mm. long, the pedicels about 1 mm. long; outer sepals almost lanceolate, acute, ciliate, the two lower about 1.5 mm. long, two-thirds connate, 1-nerved, glabrous beneath, the

longer 5-nerved upper one pubescent beneath; wings 5–5.4 mm. long, ciliate and obtuse at base, glabrous beneath, 4–5-nerved; keel 4.8–6 mm. long, pubescent within, 3–4-nerved, 3-lobed, the middle lobe obtuse, emarginate; upper petals slightly spathulate, pubescent within; stamens 8, the filaments more or less united; ovary pubescent below, sometimes becoming glabrescent, the glabrous styles geniculate above the base, cylindric; upper stigma lobe with one papillose tubercle; drupe elliptic, 5–7.5 mm. long, glabrescent, reticulate.—This is the type of the genus *Monnina*. Illustrated, Ferreyra, l.c. *pl. 7*. F.M. Neg. 7978.

Huánuco: South of Mito, 3,000 meters, *1848*. "In Huanuci Provincia," *Ruiz & Pavón*, type.

Monnina pseudo-polystachya Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 217. 1934; 153.

Similar to *M. polystachya* and weakly separated from that and *M. Pavoni;* branches densely pubescent; leaves thicker, 2.5–10 cm. long, mostly 1–4 cm. wide; panicles to 12 cm. long, the numerous racemes subsessile; outer sepals strongly pubescent beneath with rigid trichomes, the keel glabrescent within, the wings somewhat pubescent and ciliate near or at base; ovary densely pubescent, the style conspicuously so above.—Illustrated, Ferreyra, l.c. *pl. 7*.

Huánuco: Muña, trail to Tambo de Vaca, 2,400 meters, *4317*, type.

Monnina pseudo-salicifolia Ferr. Journ. Arnold Arb. 27: 145. 1946.

Resembles *M. marginata* but is less robust, the branches 2–4 mm. thick, the leaves more or less elliptic, 3.5–9.2 cm. long, 1.8–3.6 cm. broad, the lower sepals 3-nerved, only slightly connate, about 2.5 mm. long, the upper sepal 5-nerved, about 3 mm. long, the wings glabrous beneath but pubescent within as the keel, while the upper petals are conspicuously puberulent both sides; petioles 1–2 mm. long; racemes 6–8 mm. thick, rachis 3.5 cm. long; bracts 2–2.2 mm. long; flowers 4.6–5.5 mm. long; ovary pubescent or more or less glabrescent.—Superficially resembles *M. salicifolia* R. & P. from which it differs in its united lower sepals, pubescent ovary, and otherwise. Illustrated, Ferreyra, l.c. *pl. 4*.

Piura: Above Palambla, Prov. of Huancabamba, 3,000 meters, *Weberbauer 6055*, type.

Monnina pterocarpa R. & P. Syst. Veg. 174. 1798; 132. *M. augustifolia* DC. Prodr. 1: 340. 1824. *M. chanduyensis* Chodat, Bull. Herb. Boiss. 2: 167. 1894. *M. pterocarpa* var. *exauriculata* Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 202. 1934.

Frutescent, often several sometimes many dm. high, the erect terete glabrescent stem to 7 mm. thick, the branches elongate; petioles 1–2.5 mm. long, pubescent; leaves linear or the lower ovate-lanceolate, attenuate at base, usually acute, 11–55 mm. long, 3–22 mm. wide, glabrescent above, slightly pubescent beneath, with 4–5 lateral veins; racemes terminal, shortly peduncled, more or less conical, acute, 8–11 mm. wide, the finely pubescent axis 7–22 mm. long, the filiform deciduous 1-nerved bracts about 2 mm. long, pubescent beneath, and ciliate; flowers 4–4.6 mm. long, the glabrous pedicels to 1 mm. long; outer sepals free, lanceolate, acute, pubescent beneath and ciliate, the two lower to 2 mm. long, 3-nerved, the upper one 2–2.5 mm. long, 3–5-nerved as the glabrous purple wings, these obovate, acute at base, 4–5 mm. long; keel yellow, 4–5.8 mm. long, almost orbicular, plicate, glabrous within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse, emarginate; upper petals pubescent within; stamens 8, the acute tube pubescent, the anthers emarginate; ovary elliptic, glabrous as the longer style, this geniculate near base, the much wider tip with two usually conspicuous auricles, the lower stigma-lobe rather acute, the upper 2-tubercled; samara ovate, 3.5–8 mm. long, 3–7 mm. wide, strigillose, becoming glabrescent, the membranous wing 1–2.5 mm. wide, deeply emarginate at apex and base, the body rugose-reticulate.—Wing of samara is sometimes irregular and asymmetrical (*M. chanduyensis*). However, some specimens from Piura have symmetrical samaras while those in the material from Lima appear to be asymmetrical. *Pennell 14812* and *Svenson 11221* have an inconspicuous winged style; *Pennell 14467*, small anthers and filaments with the upper part more or less free. Resembles a tall Polygala. Dry coastal areas between 20 and 2,000 meters. Illustrated, Bot. Mag. 58: *pl. 3122* (as *M. obtusifolia*); Ferreyra, l.c. *pl. 1.* F.M. Negs. 13108 (*M. chanduyensis*); 24313; 24319; 7973 (*M. angustifolia*).

Tumbez: Caucas, Prov. of Tumbez, *Weberbauer 7757* (isotypes of *M. pterocarpa* var. *exauriculata*).—Piura: Talara, *Johnston 3512; Haught 7; Ferreyra 5938; 6051.* Piura y Sullana, *Ferreyra 6005.* Parinas Valley, *Haught 91.* Paita, *Pennell 14812.*—Lima: 1838–42, *Wilkes Exped.* Near Lima, *Martinet.* Quives, *Pennell 14298.* Near Viscas, *Pennell 14467.* Santa Eulalia, Prov. Huarochiri, Chosica, *Goodspeed 11308.* Chosica, *2874; 494; Mexia 4007; Rose & Rose*

18545; Grant 7393; Soukup 2049; Ferreyra 543; 596; 3488. Chosica to Ricardo Palma, *Ferreyra 5333.* Prov. of Cajatambo, *Ferreyra 3553; 3561.*—Ayacucho: Nazca to Puquio, *Ferreyra 5452.* Without locality and date, *Dombey 28; Gay; Pavón,* type, "ex Lima," 1807, *Lagasca 54* (type, *M. angustifolia*). To southwestern Ecuador.

Monnina ramosa Johnst. Contr. Gray Herb. 70: 77. 1924; 136.

Erect, conspicuously branched more or less herbaceous annual, 1.5–2 dm. high from a branched curved root; branches 4–12 cm. long, canescent-pubescent; petioles to 1 mm. long; leaves linear, attenuate at base, obtuse or rarely acute, 1–3 cm. long, 1–2.5 mm. wide, finely pubescent, revolute; racemes conical, 5–8 mm. wide, the peduncle short, the axis 5–10 cm. long, canescent-pubescent, the bracts linear or lanceolate, 2.5–3 mm. long, pubescent beneath and ciliate, 1-nerved; flowers 3.5–4.8 mm. long, the glabrous pedicel 0.5–0.7 mm. long; outer sepals free, ciliate, lanceolate, 3-nerved, the two lower 1.4–1.7 mm. long, the upper one 2–2.2 mm. long; wings white, 4–5 mm. long, obovate, 3-nerved, keel yellowish, 4–5 mm. long, both glabrous, the former obovate, 3-nerved, the latter orbicular, 3-lobed, the middle lobe emarginate; upper petals elongate, pubescent within; stamens 8, the united filaments glabrous, the subsessile anthers emarginate; ovary glabrous, the longer glabrous style straight becoming geniculate above, the upper lobe of the broad stigma 1-tubercled, elongate, cylindric; samara ovate, 3.5–4 mm. long, strigillose, the wings about 1 mm. wide, membranous, deeply emarginate at apex and base, the body rugose-reticulate.—Illustrated, Ferreyra, l.c. *pl. 2.*

Arequipa: On sandy pampa at 3,300 meters, on south slope of Chachani Mountain near Arequipa, *Hinkley & Hinkley 13,* type. Arequipa desert, *Cockerell.*

Monnina Ruiziana Chodat, Bot. Jahrb. 42: 100. 1908; 154.

Shrub, to 3 meters high, the branches elliptic, more or less acute; leaves, these 4–5 cm. long, 3.5–4 cm. wide, and paniculate inflorescence densely hirsute; petioles 4–6 mm. long; racemes divaricate, lax, the almost deciduous filiform bracts obscure; flowers 3.5–4 mm. long, shortly pediceled; outer sepals ovate-triangular, obtuse or more or less acute, ciliate, pubescent beneath, the two lower connate; wings orbicular, attenuate at base; keel yellow, hemispheric, obtusely 3-lobed; upper petals linear or dilated; filaments almost entirely united, pubescent above; ovary glabrous or rarely somewhat

pubescent, the style geniculate; fruit unknown.—Forma *longepetiolata* Chodat, l.c. page 101, has petioles to 7.8 mm. long. No material seen, the description compiled. F.M. Neg. 13136.

Huánuco: Monzón, Prov. of Huamalies, *Weberbauer 3355*, 2,000 to 2,900 meters, type; *3527*, type, forma.

Monnina salicifolia R. & P. Syst. Veg. 172. 1798; 157. *M. crotalarioides* DC. Prodr. 1: 339. 1824 et vars. *glabrescens, pseudoloxensis, macrophylla* and *leptostachys* Chodat, Bot. Jahrb. 42: 99. 1908.

Shrub, sometimes 2.5 meters high, with nodose early pubescent branches 1–5 mm. thick; petioles 1–2.5 mm. long, concave above, articulate, pubescent; leaves usually elliptic, obtuse or sometimes acute, to 7 cm. long, 2.5 cm. wide, mostly smaller, slightly revolute, glabrate in age, with 4–5 lateral veins; racemes conical, acute, 9–12 mm. wide, simple, terminal on peduncles 5–12 mm. long, the pubescent striate rachis 1–8 cm. long, the acute or acuminate bracts 1.4–3 mm. long, 1-nerved, puberulent beneath; flowers 4.5–6.5 mm. long, the puberulent pedicels 1–1.4 mm. long; outer sepals free, ovate-triangular, obtuse, more or less pubescent beneath, the two lower 1.4–2.2 mm. long, 3-nerved, the slightly longer upper one 5-nerved; wings indigo blue, 5.6–6.8 mm. long, usually lightly pubescent beneath, sometimes with a few trichomes within, 3–4-nerved as the yellow 3-lobed keel, this usually pubescent within; upper petals more or less elongate, pubescent; stamens 8, the filaments almost entirely connate, glabrous as the ovary and geniculate cylindric style, or this rarely pilose, var. *pilostylis* Ferr. l.c. page 158, lower stigma lobe acute, the upper with one papillose tubercle; drupe ellipsoid, often 5–6 mm. long, glabrous, reticulate.—Type localities of Ruiz & Pavón, "Huarocheri, Tarma et Panatahuarum Provincias," from Departments of Lima and Junín. Known between 1,800 and 3,900 meters, very common and not all of the available collections cited. Illustrated, Ferreyra, l.c. *pl. 8*. F.M. Negs. 7976 (*M. crotalarioides*); 7975.

Cajamarca: *Ferreyra 3191; 3208*.—Libertad: Eastern base of Cerro Huaylillas, Prov. of Huamachuco, *West 8125; Ferreyra 3000; 3051*.—Ancash: Chiquian, Prov. of Bolognesi, *Ferreyra 5603; 5801*. —Huánuco: *Stork & Horton 9375*. Panao, Prov. of Pachitea, *Ferreyra 1767; 1807; 1810; 1818*.—Lima: Río Blanco, *664; Killip & Smith 21621; 21609; 21569* (type, var. *pilostylis*). Matucana, *95*, Huarochiri, *Hrdlicka*. San Damian, *Hrdlicka*. Near Surco, *Ferreyra*

5395; 5397; 688. Oyon, Prov. of Cajatambo, *Ferreyra 3535* (var. *pilostylis*).—Junín: Vicinity of Oroya, *Rose & Rose 18698.* Quebradas east of Huancayo, *Stork & Horton 10220.* Between Viques and Ingahuasi, Mantaro Canyon, *Killip & Smith 22175.* Parco, Jauja to Oroya, *Ferreyra 2828.*—Ayacucho: "Tambillo," *West 3651.*—Huancavelica: Near Cordova, Prov. of Castrovirreina, *Metcalf 30276.* North of Yauli, Prov. of Huancavelica, *Stork & Horton 10882* (var.).—Apurímac: Pincos, Prov. of Andahuaylas, *Stork & Horton 10680.* Chincheros, *West 3693; Ferreyra 2797.*—Cuzco: Paucartambo Valley, *Herrera 2965.* Huaillabamba, *Balls 6739.* Below Colquipata, *Pennell 13784.* Cerro Macchu Picchú, Prov. of Urubamba, *Mexia 8074a.* Summit of Huayna Picchú, *West 6430.* Macchu Picchú, *Ferreyra 2797.* Ollantaytambo, *Cook & Gilbert 1219.* San Miguel, Urubamba Valley, *Cook & Gilbert 1154; Soukup 33.* Saxaihuamán, above Cuzco, *Pennell 13549; Herrera 2376.* Colinas del Rodadero, *Vargas 3147.* Vilcanota, below Caicai, *Pennell 14188.* Marcapata, Prov. of Quispicanchis, *Vargas 1334.* Prov. of Quispicanchis and Cuzco, *Herrera 682.* San Sebastián, *Pennell 13617.* Convención, *Vargas 1838.* Mantaro, *Herrera 763a.* Saxaihuamán, *Ferreyra 2617. Née* without number, type, Paris Herbarium. Bolivia; Ecuador.

Monnina stipulata Chodat, Bull. Herb. Boiss. 2: 170. 1894; 148.

Frutescent, to 1 meter high, the branches 4–7 mm. thick, early densely pubescent, with yellow lax trichomes; petioles 3–6 mm. long, densely pubescent, articulate, cylindric; leaves ovate-elliptic, obtuse, sometimes almost acute, 3.5–9 cm. long, 1.5–4 cm. wide, finely pubescent above, becoming glabrescent, prominently canescent-pubescent beneath, strongly revolute with 7–8 lateral veins; racemes subsessile, axillary or terminal, simple, conical, 8–27 mm. long, 7–9 mm. wide, the densely pubescent rachis to 3 cm. long, with triangular concave acute ciliate 1-nerved bracts 1.8–2.5 mm. long, pubescent beneath; flowers 4–6 mm. long, the pubescent pedicels less than 1 mm. long; outer sepals ovate, obtuse, ciliate, pubescent beneath, the two lower 2 mm. long or slightly longer, two-thirds connate, 5-nerved, the upper one about 3 mm. long and 7-nerved; wings 5–6 mm. long, 4–5-nerved, slightly pubescent beneath, glabrous within; keel 5.5–7 mm. long, pubescent within, 7–8-nerved, 3-lobed, the middle lobe obtuse, emarginate; upper petals more or less spathulate, pubescent; stamens 8, the filaments almost entirely united, the anthers mucronate; ovary rarely with a few trichomes on the upper part, the glabrous style geniculate medially, the upper stigma lobe 1-tubercled, papillose.—The species is characterized by the short simple terminal

racemes and ovate-elliptic strongly revolute leaves. The significance of the name has not been clarified. The range is Bolivia. Illustrated, Ferreyra, l.c. *pl. 5.*

Puno: North of Limbani, Province of Sandía, *Metcalf 30511.* Bolivia.

Monnina tomentella Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 210. 1934; 164.

Resembles *M. densecomata;* branches divaricate, 2.5–3 mm. thick, strongly ligneous, densely pubescent, with lax yellow trichomes 1–1.2 mm. long; petioles concave above; leaves elliptic or lanceolate or somewhat oblanceolate, obtuse, conspicuously tomentose, not revolute; rachis of inflorescence 10–18 cm. long, canescent-tomentose as the obtuse racemes, these ascendant, almost rigid; upper sepals acute; wings more or less pubescent within, the keel glabrous; drupes to 5 mm. long, almost truncate at base.—Illustrated, Ferreyra, l.c. *pl. 10.*

Piura: Above Huancabamba, eastern cordillera, 2,600 meters, *Weberbauer 6139,* type.

Monnina Vargasii Ferr. Journ. Arnold Arb. 27: 162. 1946.

Herbaceous perennial, hirsute, the branches notably so, 2–3 mm. thick; petioles 3–7 mm. long, densely puberulent; leaves lanceolate, long-attenuate to base, more or less acuminate, 4.5–12 cm. long, mostly 1.5–4 cm. wide, puberulent both sides, the lateral nerves 7–8; racemes 2–3 aggregate, more or less conical, 6–9 mm. thick, the densely puberulent rachis 5–8 cm. long with lanceolate bracts 2.6–4.8 mm. long, puberulent beneath; flowers 5–6 mm. long, the pedicels nearly 1.5 mm. long; outer sepals free, lanceolate, puberulent beneath, the two lower to 2.4 mm. long, 3-nerved, acute, the longer upper one 5-nerved, obtuse; wings 6–7 mm. long, glabrous except for cilia, 4–5-nerved as the quite as long keel, this glabrescent within, 3-lobed; upper petals elongate, puberulent both sides; stamens 8, the short free part of the filaments glabrous; ovary more or less puberulent; style geniculate, finally horizontal, glabrous, the upper stigma tip tuberculate, papillose, the lower obtuse.—Near *M. pilosa* HBK. of northern Peru, from which it differs in its herbaceous habit, lanceolate leaves and pubescent ovary; it also suggests *M. acutifolia* Chodat but the racemes are smaller and the lateral leaf nerves 7 or 8. The species is dedicated to Dr. Cesar Vargas, Professor of Botany at the University of Cuzco. Illustrated, Ferreyra, l.c. *pl. 9.*

Apurímac: Bosques de Ampai, Prov. of Abancay, 3,300 meters, *Vargas 771*, type.

Monnina Vitis-Idaea Chodat, Bull. Soc. Bot. Genève, sér. 2. 25: 208. 1934; 146. *M. arbuscula* Chodat, l.c. 222.

Shrub to 3 dm. high, well marked by the glabrous nodose woody stem, this 5–7 mm. thick, and the small coriaceous leaves, these usually elliptic, rarely ovate, 1–2 cm. long, 5–8 mm. wide, obtuse, slightly revolute, glabrescent, with 4–5 lateral veins; petioles 1–1.5 mm. long, cylindric, more or less pubescent; peduncles short, the conical racemes 6–8 mm. wide, 12–16 mm. long, finely pubescent and with inconspicuous triangular bracts; flowers about 4 mm. long, the finely pubescent pedicels less than one mm. long; outer sepals ovate-triangular, ciliate, glabrous beneath, the two lower about 2 mm. long, one-half connate, obtuse, conspicuously 1-nerved, the upper one 2–2.4 mm. long, acute, 5-nerved; wings 4–5 mm. long, pubescent within, glabrous beneath, strongly 3–4-nerved; keel 3.5–4 mm. long, glabrous, 3–4-nerved, 2-lobed, the lobes obtuse; upper petals notably elongate-spathulate; stamens 8, the filaments almost entirely united, the anthers mucronate; ovary ovate-truncate, glabrous as the geniculate cylindric style, the upper stigma lobe 1-tubercled, papillate; drupe ovate, 5–8 mm. long, glabrous, reticulate. —Distinctive characters are, especially, the prominently nerved sepals, the 2-lobed keel, and the mucronate anthers. Illustrated, Ferreyra, l.c. *pl. 5*.

Piura: East of Huancabamba, *Weberbauer 6129*, type, and type of *M. arbuscula*.

Monnina Weberbaueri Chodat, Bot. Jahrb. 42: 102. 1908; 138.

Herbaceous annual, sometimes several dm. high from a slender branched to curved root, the erect terete branched stem pubescent with short yellowish trichomes; petioles 1–2 mm. long, pubescent; leaves lanceolate, rarely elliptic-spathulate, attenuate at base, obtuse or sometimes acute, 12–46 mm. long, 6–26 mm. wide, glabrescent, with 6 or 7 lateral veins; peduncles 1.5–4 cm. long, the axis of the terminal conical racemes 2.5–16 cm. long, finely pubescent, the ciliate filiform 1-nerved bracts at most 1.6 mm. long; flowers 2.8–5 mm. long, the pedicels about 0.5 mm. long; outer sepals free, lanceolate, ciliate, the two lower about 1.5 mm. long, 1-nerved, the upper one 2–2.2 mm. long, (1–)3-nerved; wings purple, often 3–4 mm. long, obovate ciliate, 3–4-nerved; keel yellow, 3.4–5 mm. long, pubescent

within, acute at base, 3–4-nerved, 3-lobed, the larger middle lobe acute; upper petals short, pubescent within; stamens 8, the completely united filaments glabrous, the anthers emarginate; ovary glabrous, as the longer straight style, this becoming slightly geniculate near apex, almost cylindric; upper stigma lobe 2-tubercled; fruit ovate without wings, about 2 mm. long, glabrescent, rugose-reticulate.—Possibly related to *M. macrostachya* but distinguished by its drupaceous fruit and its slender and shorter racemes; moreover it is endemic to the lomas. Illustrated, Ferreyra, l.c. *pl. 2.* F.M. Neg. 13144.

Lima: Lomas Pasamayo, south of Chancay, *Stork & Vargas 9351.* Lomas south of Lima, *Grant 7440.*—Arequipa: Mollendo, *Johnston 3551; Hitchcock 22422; Weberbauer 1505,* type. Posco, *Cook & Gilbert 47.*

5. **MOUTABEA** Aublet

Acosta R. & P. Prodr. 1. 1794; Syst. Veg. 1. 1798.

Glabrous, with thick fleshy leaves. Racemes short, axillary, the flowers white or ochroleucous. Sepals little unequal, united as the petals. Stamens 5–8 in a sheath adnate to corolla, the 5–8 anthers sessile. Ovary 4(2–5)-celled. Fruits drupaceous, glabrous, indehiscent, 2–5-seeded, edible.—Name originally spelled as above from the native name "Aymoutabou."

Moutabea aculeata (R. & P.) Poepp. & Endl. Nov. Gen. & Sp. 2: 62. 1838. *Acosta aculeata* R. & P. Syst. Veg. 1. 1798; Fl. Peruv. 1: 5. *pl. 6.* 1798.

A slender tree with tuberculate-aculeate branches, the compressed deltoid spines of branchlets 2 mm. long, petioles thick, 1 cm. long, 4 mm. wide; leaves obovate-elliptic or oblong, acute at base, shortly acuminate, 15 cm. long, a third as wide or somewhat larger, very rigid-coriaceous; flowers white, slender, subcylindric, 1 cm. long, subsessile in axillary racemes about 2 cm. long; anthers 8; drupe with 4 seeds in a yellow edible pulp.—From similarity of the fruit to that of *Achras caimito* the natives call it "Caimito de Monte" (Ruiz & Pavón). The rather similar *M. longifolia* Poepp. & Endl. l.c. of the Amazon has veiny oblong-lanceolate leaves, racemes to 5 times longer than petioles, flowers less slender, 1.5–2 cm. long on flexuous perhaps scandent branches. F.M. Neg. 29601.

Huánuco: Chinchao, Machaynio and Macora, *Ruiz & Pavón,* type.—Loreto: Yurimaguas, *Poeppig.* Maucallacta, Río Paranapura, *Klug 3936.*

6. DICLIDANTHERA Mart.

Shrubs or trees with clambering tortuous or pendulous branches, small caducous stipules, alternate entire elliptic or lanceolate veiny leaves, white or ochroleucous hermaphrodite flowers borne in axillary or terminal racemes. Calyx deeply 5-lobed, shortly campanulate, the narrow divisions imbricate. Corolla elongate-cylindric. Stamens 8–10, joined to corolla tube. Anthers sessile or nearly, cordate, introrsely dehiscent. Ovary superior, globose, 5-celled, style simple, stigma capitate. Ovule solitary, anatropous, pendulous. Fruit capsular.—Carlos A. O'Donell, Lilloa 6: 207–212. *pls. 1, 2.* 1941, has substantiated Martius' judgment that this genus is very closely related to *Moutabea,* thus removing it from the vicinity of *Styrax.* Both genera, especially in their regular flowers, are, however, not characteristic for the Polygalaceae but otherwise they do not seem to be particularly aberrant.

Leaves to 6 cm. wide; stamens 8; corolla about 1.5 cm. long. *D. octandra.*

Leaves about 4 cm. wide; stamens 10; corolla 2.5 cm. long. *D. penduliflora.*

Diclidanthera octandra Gleason, Phytolog. 1: 110. 1934.

A shrub, the type 3 meters tall, the finely pubescent flowering branchlets angulate and widely spreading; petioles 5–8 mm. long; leaves elliptic-oblong, obtuse both ends, to 13 cm. long, 6 cm. wide, glabrous or the younger puberulent above on midnerve, pinnate lateral nerves about 8, reticulate venation prominent both sides; spikes solitary in the upper axils, finally 7 cm. long; sepals oblanceolate-oblong, about 6.5 mm. long, rounded at tip, puberulent-tomentulose, nearly plane at anthesis; corolla tube 11–12 mm. long, rather fleshy, lightly pilose, slightly ampliate above the somewhat spreading obovate lobes 3.5–4 mm. long; stamens 8, 3 of them larger and fertile, the remaining gradually smaller, the fleshy filaments 1 mm. long; style villous, 3 mm. long in bud.—Differs in habit and in foliage from the three other known species, and in having only 8 stamens (Gleason). The author also allies it to *Barnhartia* Gleason of British Guiana with 7 or 8 irregularly inserted stamens and unequally developed petals; the similar *Lissocarpa* Benth. of the Río Negro has 8 stamens but they are inserted near the base of the corolla and the filaments form an 8-dentate tube. These allied plants have also been assigned to separate families, Diclidantheraceae and Lissocarpiaceae and this disposition might be more convenient, especially

since they are aberrant either here in the Polygalaceae or in the Styracaceae, as noted above.

Río Acre: Near mouth of Río Macauhán, *Krukoff 5778*, type. Brazil?

Diclidanthera penduliflora Mart. Nov. Gen. & Sp. 2: 140. *pl. 196*. 1826.

Branchlets slender; petioles with a cupulate gland at base of leaf-blade, this ovate-elliptic, shortly or obtusely cuspidate or rounded at tip, often 10–11 cm. long, about 4 cm. wide, glabrous; racemes pendulous, usually a dm. long or longer; flowers bracted, solitary or 2–3 together, the rachis puberulent; calyx glabrate or pubescent, the slender segments obtusish; corolla yellowish, or white, slightly fragrant (Mexia), villous within, 2.5 cm. long; ovary glabrous.—Illustrated, Martius, l.c. and Fl. Bras. 7: *pl. 4*.

Loreto: Río Itaya, *Mexia 6481* (det. Standley). Brazil.

TRIGONIACEAE Endl.

Reference: Warming in Mart. Fl. Bras. 13, pt. 2. 1875.

Trees or lianas with alternate or opposite simple leaves, usually small caducous stipules, racemose or paniculate flowers with 5 imbricate, more or less unequal sepals that are free or connate only at base as also the 3 or 5 unequal and contorted petals, the posterior usually the largest and gibbous at base. Stamens 3–12, unilateral and sometimes in part infertile, the filaments connate at base or below, the anthers 2-celled, longitudinally dehiscent. Ovary superior, 3-celled, lanate or strigose, the single style truncate. Ovules 2–many in each cell. Fruit a 3-valved septicidal capsule, the compressed seeds involved in cottony indument.—There is often a gland or crenate crest opposite the posterior petal.

1. TRIGONIA Aublet

Character as given for the family.

Flower clusters sessile or nearly at least at anthesis; flower buds 5–7 mm. long.

Leaves concolor.

Buds 6–7 mm. long; pubescence drying brown....*T. macrantha.*

Buds 5 mm. long; pubescence cinereous in part...*T. Spruceana.*

Leaves bicolor, white tomentose beneath as the 5 mm. long buds.
Bracts linear; stipules tomentose, rather caducous....*T. nivea.*
Bracts ovate; stipules persisting, glabrate.....*T. Killipii.*
Flower clusters peduncled often even in bud, the flowers pedicellate.
Leaves bicolor, gray-white beneath, green above.....*T. sericea.*
Leaves concolor, nearly glabrous.
Mature buds about 5 mm. long; lateral nerves anastomosing before margin.
Leaves subcoriaceous, the 10–12 lateral nerves 5–8 mm. distant.....*T. Spruceana.*
Leaves membranous, the 5–8 lateral nerves 1–1.5 cm. distant. *T. virens.*
Mature buds 2–3 mm. long; 5–6 lateral nerves lost in the margin.....*T. parviflora.*

Trigonia Killipii Macbr., sp. nov.

Speciei *T. nivea* Camb. similis, differt ramulis petiolis inflorescentiisque dense hirsuto-pilosis, stipulis persistentibus glabratis haud tomentosis, foliis 9–10 cm. longis, 3.5–5 cm. latis, bracteis fere 2 mm. latis.—Perhaps *T. echiteifolia* Rusby, Bull. N. Y. Bot. Gard. 4: 324. 1907 of Bolivia, but the stems of that species according to Killip scarcely hirsute-pilose; ex char. it also has shorter leaves and there seem to be other differences. My friend called my attention to my error in determining, a number of years ago, this plant as *T. sericea*, which it simulates only in foliage. My specimen was from a long-branched shrub or liana sprawling or supported in sunny brush, the flowers fragrant.

Junín: La Merced, *5513*, type. East of Quirimí Bridge near La Merced, *Killip & Smith 23846*.

Trigonia macrantha Warm. in Mart. Fl. Bras. 13, pt. 2: 129. 1875.

Branchlets glabrous, sparsely lenticellate, 3 mm. thick; petioles 10–12 mm. long; stipules densely ashy puberulent or glabrate, linear, 7 mm. long; leaves oblong-elliptic, rounded-subcordulate at base, abruptly acuminate, to 12 cm. long, 4–5 cm. wide, thin, the 10–12 nerves as the transverse veins prominent beneath where finely arenose-tomentulose or glabrous, nearly glabrous above, lustrous both sides; inflorescences and calyces, these both sides, brownish tomentulose, the subsessile cymes 3–7-flowered; bracts linear-lanceo-

late, 7–10 mm. long, bractlets 4–5 mm. long, peduncles and pedicels 1 mm. long; calyx segments (outer) acute, 8 mm. long, half as wide, the rest 2 mm. wide, the petals about half as long, 2 carinate, 2 spathulate; stamens 6 fertile, 4 sterile; ovary hirsute, the style glabrous except at base.—F.M. Neg. 12948.

Loreto: Yurimaguas at the Río Huallaga, *Spruce 3871*, type. Balsapuerto, *Klug 2954; 3028* (both det. Standley, *T. Spruceana*).

Trigonia nivea Camb. in St. Hil. Fl. Bras. 2: 113. 1829; 134.

Liana with long branchlets, these with petioles 5–6 mm. long, leaves beneath and panicles, including the calyces without, densely appressed arenose- or pilose-tomentulose, this indument rather fulvescent in inflorescence; stipules oblong, often bifid, 6–10 mm. long, puberulent within, tomentose without; leaves lanceolate to subelliptic, rarely obovate, acutely narrowed at base, acute or narrowly acuminate, mostly 5–8 cm. long, 1.5–2.5 cm. wide, often revolute, finely floccose-lanuginose or nearly glabrous above, pilose beneath as the 10–14 prominent subparallel nerves, these finally impressed above; cincinni sessile or nearly, 2-flowered in terminal and many axillary racemes; bracts and calyces tomentose, not at all sericeous, the former linear, 4–5 mm. long; pedicels at most 1–1.5 mm. long; buds 4–5 mm. long; sepals lustrous within, little pubescent; fertile stamens 6–8; ovary hirsute, style glabrous; capsules elongate-oblong, 6–7 mm. long, densely rufo-pilose without, laxly tomentose within, the seeds reddish sericeous.—From the known range of the species the determination of the Peruvian specimen not seen recently may be questioned. F.M. Neg. 35058.

Río Acre: (*Ule 9519*, det. Pilger). To eastern Brazil.

Trigonia parviflora Benth. in Hook. Journ. Bot. Misc. 3: 163. 1851; 130.

Branchlets—these 3–4 mm. thick—and especially inflorescences ashy appressed pubescent, the latter elongate and with 3–7-flowered cincinni; petioles 6–8 mm. long; leaves ovate-oblong or elongate-ovate, acute or obtuse, sometimes shortly acuminate, lightly cordate to rounded at base, membranous or chartaceous-coriaceous, glabrous and lustrous except the petioles and the 5–6 lateral nerves, 10–12 cm. long, 4.5–5.5 cm. wide, or smaller; bracts and bractlets 1–2.5 mm. long, the peduncles and pedicels very short; calyces pubescent both sides, 2–3 mm. long; petals to 4 mm. long; sterile filaments 2–3,

fertile 6 and with 2 bi- or tri-lobed glands; capsules nearly 3-lobed, tomentose, 8 mm. long.—F.M. Neg. 12955.

San Martín: Near Tarapoto, *Spruce 4944.*—Río Acre: Seringal San Francisco, *Ule 9520; 9640.* Brazil; Bolivia.

Trigonia sericea HBK. Nov. Gen. & Sp. 5: 141 (109). 1822.

Liana, the leaves mostly persistently sericeous tomentose beneath, the divaricately branched panicles finely tomentulose or glabrate; stipules ovate-lanceolate, 4–6 mm. long; petioles tardily glabrate, dilated at base, 10–16 mm. long; leaves obovate, rounded at base, acute or apiculate, entire, reticulate-veined, subcoriaceous, the 8 or so lateral nerves glabrate beneath, about 1 cm. distant, anastomosing faintly before the margin, glabrous green and lustrous above, 1–1.5 dm. long, 5–10 cm. wide; cymules soon distinctly peduncled, the narrow or revolute bracts and pedicels subequal; buds 3–4 mm. long; calyx segments oblong, little unequal, tomentose without; petals 5, about 4 mm. long, whitish, glabrous, rounded, the upper ovate and gibbous, the 2 lateral narrowly obovate, the 2 lower obliquely elliptic; stamens 7, the membranous filaments connate below; fruits 3–4 cm. long, 1.5 cm. thick.—Shrub, 12–15 meters high (Schunke). F.M. Neg. 12951.

Loreto: Río Itaya, *Killip & Smith 29542; Williams 3357.* Mishuyacu, *Klug 1004.* Río Mazán, *José Schunke 50* (det. Standley). Colombia.

Trigonia Spruceana Benth. ex Warm. in Mart. Fl. Bras. 13, pt. 2: 130. 1875.

Branchlets terete, the 4 lines decurrent from leaves being obsolete, the tips as petioles (7–8 mm. long), axis of dense inflorescence (3–9 cm. long) sordidly fulvescent or canescent with a short indument, the calyces closely appressed white-tomentose without, very sparsely so within, acute, about 5 mm. long, 2.5–3 mm. wide; stipules caducous, the upper about 2 mm. long, densely pilose; leaves oblong-elliptic, obtuse or somewhat rounded at base, shortly and acutely acuminate, 7.5–8.5 cm. long, 3–4 cm. wide (only upper seen), nearly coriaceous, concolor and glabrous except for a few appressed trichomes on the opaque under surface where the 10–12 lateral nerves are prominent but anastomosing arcuately before the margin; cincinni mostly 1-flowered, some 2–4-flowered, all 1–2 mm. long, peduncled, the pedicels as long; buds 5 mm. long; bracts about 2 mm. long, linear; petals about 6 mm. long; fertile stamens 6–7; style

pilose.—Much Peruvian material has been referred here but apparently not correctly; the species differs from *T. macrantha* in shorter bracts, buds and pubescence. F.M. Neg. 12953.

Peru (possibly). Amazonian Brazil.

Trigonia virens Macbr. Field Mus. Bot. 11: 68. 1931.

A more or less subappressed hirsutulous liana, especially the branchlets and leaf-nerves; adult leaves about 12 cm. long, 5–6 cm. wide, glabrous except for the 5–8 larger nerves, scarcely nitidulous, membranous, acute or obtuse at base, subabruptly and acutely acuminate; inflorescence tomentose (except calyces within), 4–8 cm. long, the 1- or 2–3-flowered cincinni in racemes; peduncles 2–3 mm. long; pedicels scarcely longer; bracts narrowly ovate, the lowest to 4 mm. long; buds about 5 mm. long; petals perhaps 6 mm. long, the 2 carinate broadly oblong.—Maybe allied to *T. hypoleuca* Griseb. but glabrate; otherwise to *T. Spruceana* Benth. and *T. macrantha* Warm.; its thin broad leaves with fewer nerves distinguish it from the former; its early peduncled flower clusters, calyx glabrate within, and dull more hirsutulous leaves from the latter.

Loreto: Wooded banks, Río Itaya, above Iquitos, *Killip & Smith 29539*, type. Brazil.

DICHAPETALACEAE Engler

References: Engler & Krause, Pflanzenfam. ed. 2. 19c. 1931; Baillon in Mart. Fl. Bras. 12, pt. 1: 366–379. 1886.

Slender trunked trees or shrubs (usually), sometimes clambering, with alternate short-petioled entire leaves, small (rarely fimbriate) deciduous stipules and rather inconspicuous flowers, often congested in axillary panicles, or borne together on the petioles, or on the leaf blades, polygamous or dioecious, rarely hermaphrodite, often a little irregular. Sepals and petals 5(4), the former usually equal, sometimes basally united, the latter free or more or less coherent and ordinarily rounded or in varying degrees parted apically. Disk often with glands or appendages at base of petals with which the stamens are sometimes more or less joined, these usually 5(3), the anthers with broadened connective. Ovary 2–3-celled, styles 2–3 rarely united nearly to tip, the stigmas mostly capitulate; ovules 2, pendent. Fruits often obliquely ovoid and rather flattened, commonly pubescent and 1-seeded.—Thought to be closely allied to Euphorbiaceae with which Baillon united it. Some species, notably in *Dichapetalum*, contain a very poisonous alkaloid.

Inflorescence distinctly peduncled; corolla regular, the petals free or nearly.....1. *Dichapetalum.*

Inflorescence sessile or nearly, borne on the petioles.

Anthers included or the tips exserted; corolla lobes more or less united, not geniculate.

Corolla regular with 5 obtuse equal lobes much shorter than the tube; fertile stamens 5, subsessile; leaves glabrous.
2. *Stephanopodium.*

Corolla bilabiate with unequal more or less free petals; fertile stamens often only 3; leaves often at least lightly pubescent.
3. *Tapura.*

Anthers clearly exserted; petals unequal, 3 free, geniculate.
4. *Gonypetalum.*

1. DICHAPETALUM Thouin

Genus characteristic for the family but restricted to species with petals free or nearly, these never geniculate, entire, emarginate, lobed or parted, the divisions often concave. Stamens usually all fertile and entirely free, sometimes the filaments coherent basally. Disk scales 5, entire, shallowly lobed, free or united.—Shrubs, lianas or small trees, only about 10 known from tropical America, most of the 200 described being from Africa and Madagascar, some of which are highly poisonous to stock.

Stipules persisting, fimbriate.....*D. stipulatum.*

Stipules deciduous, small, entire.

Leaves glabrous beneath or nearly; petioles (in Peru) often very short.

Leaves to 15 cm. wide, shortly apiculate-acuminate, puberulent beneath.....*D. Spruceanum.*

Leaves 3–7 cm. wide, caudate-acuminate, glabrescent.
D. odoratum.

Leaves pubescent beneath; petioles 2.5–10 mm. long..*D. scandens.*

Dichapetalum odoratum [Spruce] Baill. in Mart. Fl. Bras. 12, pt. 1: 371. 1886.

Climbing shrub, nearly glabrous except the lutescent puberulent new shoots; petioles obsolete or 2–7 mm. long; leaves oblong-obovate, attenuate to the subequally rounded base, shortly acuminate (in Peru, shortly caudate), to 10 cm. long, half as wide, finally gla-

brescent, the early minutely setulose nerves (about 6) rather prominent beneath; racemes about half as long as the leaves on puberulent peduncles 1–2 cm. long, basally free, apically sparsely dichotomously branched; pedicels conspicuously articulate; male calyx with subequal sepals, petals about as long, subequal; glands short, fleshy, emarginate; rudimentary ovary densely lanate; style 1, stigma capitate.—Near *D. pedunculatum* (DC.) Baill. and confused with it but with subsessile leaves, more nearly glabrous and a liana; petioles vary from 2–7 mm. long on the same plant; it is noteworthy that the type came from Catinga in northern Brazil, and the Peruvian specimens have not been compared with it; probably all of these cited should be referred to *D. Spruceanum* as glabrous smaller-leaved forms.

Loreto: Iquitos, *Klug 182; 551; 122; 226; Tessmann 5377* (det. Krause); *Williams 3783; 3640; Killip & Smith 29834* (8-meter tree). Mouth of the Santiago, *Tessmann 4514*. Northern Brazil.

Dichapetalum scandens (Poir.) Johnst. Journ. Arnold Arb. 16: 44. 1935. *Cordia scandens* Poir. in Dict. Sci. Nat. 10: 410. 1818. *D. vestitum* [Spruce] Benth. var. *scandens* [Benth.] Baill. in Mart. Fl. Bras. 12, pt. 1: 372. 1886, fide Johnston. *D. vestitum* [Spruce] Baill. l.c. 371? *D. amazonicum* K. Krause, Notizbl. Bot. Gart. Berlin 11: 135. 1931, var.

Shrubby or tree-like or the branches more or less scandent, the branchlets as petioles (2.5–10 mm. long) and the leaves on mid-nerve and the 10 prominent nerves beneath as well as the conspicuous reticulation more or less densely but always obviously fulvous puberulent or tomentulose; stipules ovate, acute, caducous, 2.5 mm. long; leaves ovate-elliptic or ovate-lanceolate, unequally rounded at base, obtuse, acute or shortly acuminate, 4–12(25) cm. long, 3–6(13) cm. wide; peduncle of the corymbose cymes completely adnate to petiole; flowers polygamo-dioecious, male very crowded; sepals notably unequal, about 3–4 mm. long, as also the petals, these lanceolate, bifid to middle; glands obcordate; fruit obovoid, densely tomentose, 12 mm. long, 10 mm. thick, obtuse at the sessile base.—After Baillon, *D. vestitum*, who lists variants not scandent, leaves obtuse or acute, and var. *cinerascens* [Poeppig] Baill. l.c., but better marked, as the indument is a shorter closer ashy puberulence, and must become *D. scandens* var. **cinerascens** [Poepp.] (Baill.) Macbr., comb. nov.; *D. amazonicum* is this variant. Illustrated, Mart. Fl. Bras. l.c. *pl. 76*. F.M. Neg. 13147 (*D. amazonicum*).

San Martín: Pongo de Cainarachi, *Klug 2626* (det. Standley). —Loreto: Iquitos, *Williams 3724; Klug 496; 858; 1431*. Mouth of the Santiago, *Tessmann 3562* (type, *D. amazonicum*). Brazil; Ecuador.

Dichapetalum Spruceanum Baill. in Mart. Fl. Bras. 12, pt. 1: 371. 1886.

Branches tortuous, subangled, the younger velvety with a yellowish indument; stipules noted only as scars; petioles 2–7 mm. long; leaves broadly elliptic, oblique at base, abruptly apiculate-acuminate, to 2.5 dm. long, 12(15) cm. wide, membranous, glabrous above, puberulent beneath on the prominent nerves and veins; inflorescence subcorymbose, well-peduncled from the petiole tips; flowers polygamous, whitish puberulent, the male 2–3 mm. long, with unequal sepals, equally bilobed petals, equal stamens; rudimentary ovary lanate; fruit unequally obovoid, 2 cm. long, 1.25 cm. thick, not attenuate at base, rugose.—Perhaps a variety of the Brazilian *D. pedunculatum* (DC.) Baill., 369, as suggested by the author, or more probably should be drawn to include *D. odoratum*, at least as to Peru, as a glabrescent smaller-leaved variant; more pubescent specimens, as *Williams 6605*, suggest intermingling with *D. scandens*. Type from a 10-meter shrub. F.M. Neg. 35901.

San Martín: Juanjuí, *Klug 4306* (det. Standley). Tarapoto, *Spruce 4927*, type; *Williams 6605*. Pongo de Cainarachi, *Klug 2751* (det. Standley, *D. vestitum*). Colombia.

Dichapetalum stipulatum Macbr. Field Mus. Bot. 11: 68. 1931.

Liana, the stems especially toward the tips densely brown-villous, finally glabrate, the tardily deciduous ovate-lanceolate nearly pinnatifid-fimbriate stipules about 5 mm. long; petioles 3 mm. long; leaves broadly elliptic, rounded or subcordate at base, abruptly and shortly acuminate, about 14 cm. long, 8 cm. wide, coriaceous-chartaceous, glabrous above except the midnerve, brown-villous beneath only on the very prominent nerves, these about 6, and above with veins conspicuously rugose-impressed; inflorescence corymbose-paniculate, densely rusty villous, to 1 dm. long, 1.5 dm. wide; pedicels 5 mm. long; petals 2 mm. long, broadly spathulate, deeply bifid; filaments narrowly margined, glabrous; style branches 2; ovary densely pilose.—Flowers, noted by collector as brownish, very much like those of *D. pedunculatum* (DC.) Baill., of the Guianas,

the subpersisting stipules subulate and entire. Fruit of *Klug 76* is densely tomentose, 2.5 cm. long, 1.5 cm. wide, in other fruiting specimens globose and smaller but probably immature.

Loreto: Mishuyacu near Iquitos, *Klug 1081*, type; also *Klug 76*. Yurimaguas to Balsapuerto, *Killip & Smith 28128*.

2. STEPHANOPODIUM Poepp. & Endl.

Slender trees or shrubs with lanceolate leaves and small fragrant flowers clustered at the top of the petioles. Sepals unequal but petals united into a long, rarely cylindrical tube with much shorter equal lobes. Stamens united to corolla, the 5 anthers free. Disk lobes 5, sometimes unequal, sometimes joined. Styles nearly divided, slender. Fruit coriaceous, 2-celled, at least in Peruvian known species.

Stephanopodium peruvianum Poepp. & Endl. Nov. Gen. & Sp. 3: 40. *pl. 246*. 1845; 377.

Glabrous except the obscurely pulverulent small (1 cm. across) cymes, about medially adnate to the petioles, these 2–4 mm. long; leaves nearly elliptic-lanceolate, unequally attenuate to base, acuminate, about a dm. long, 3–5 cm. wide, obscurely veined, especially above; pedicels 2–4 mm. long, apically attenuate to the flowers, these with linear-oblong sepals, the corolla about as long (4 mm.), with 5 short obtuse imbricate lobes; glands equal, obovate, concave above within; style short.—The fruit of the Weberbauer specimen is young but subglobose, densely orange tomentose. *S. aptotum* Wheeler, Proc. Biol. Soc. Wash. 53: 7. 1940, is unique, the author remarks, in having a 3-celled ovary, 3-styled fruit, but it is only known from Colombia. F.M. Neg. 35902.

Huánuco: Tocache, *Poeppig 1986*, type. Locality unknown to me, *Weberbauer 3693* (det. Dahlem).

3. TAPURA Aublet

Much like *Stephanopodium* but the leaves usually coriaceous and, especially, one or two of the more or less united four or five petals larger and deeply divided with concave lobes, the others smaller and sometimes entire. Stamens usually only three fertile. Disk united, forming about half a ring up to the base of the larger petal. Styles nearly united, two or three.—Like *Dichapetalum* in distribution but only two of the twelve known species in tropical Africa.

The differences noted for identification seem to have been much more emphasized by authors than the similarities, of course a not uncommon practice. For convenience the flowers are described as at petiole tip or on leaf-blade, which is probably a correct description and in any case will be clear.

Sepals 5 mm. long or longer; 3 fertile stamens with 2 staminodia.

Leaves elliptic, about half as wide as long, coriaceous; flowers at petiole tip.

Disk somewhat bidentate; leaves more or less pubescent; corolla 1 cm. long..... *T. amazonica.*

Disk entire or emarginate; leaves glabrous; corolla 1–2.5 cm. long..... *T. guianensis.*

Leaves oblongish, one-third as wide as long, membranous; flowers at or above base of leaf-blade.

Flowers on petiole tip, white or cream-colored..... *T. leucantha.*

Flowers above petiole tip, yellowish to orange... *T. peruviana.*

Sepals shorter than 5 mm.

Leaves coriaceous; flowers at tip of petioles.

Fertile stamens 5, unequal; flowers to 3 mm. long; leaf-nerves sparsely pubescent..... *T. capitulifera.*

Fertile stamens 3, equal; flowers 4–5 mm. long; leaves glabrous. *T. coriacea.*

Leaves membranous; flowers on leaf-blade; fertile stamens 3. *T. Juliani.*

Tapura amazonica Poepp. & Endl. Nov. Gen. & Sp. 3: 41. *pl. 246.* 1845; 374.

Tree or shrub early densely rusty or lutescent tomentulose, the older branchlets and leaves beneath becoming glabrate; petioles stout, to 1 cm. long; leaves elliptic or obovate-oblong, subequally acute at base, more or less acuminate or obtusish, 5–25 cm. long, 3–8 cm. wide, fleshy coriaceous, the margins often recurving and more or less ciliate where the very prominent nerves anastomose; subcapitate inflorescences 2–3 cm. wide; pedicels 1–2 mm. long; flowers of the genus, the buds to 5 mm. long, corolla to twice as long, the throat within very lanate; disk compressed, more or less obtusely bidentate; style dilated, densely pilose; fruits 3 cm. long, 2 cm. thick, obtuse, velvety, the compressed seeds glabrous.—Apparently variable, as Baillon gave names to several somewhat

aberrant specimens; said to be like *T. guianensis* Aublet (which see for variety, which may belong here) but that glabrous or nearly and the fruits subglobose. Illustrated, as above, and in Mart. Fl. Bras. l.c. *pl. 77.*

Loreto: Mishuyacu near Iquitos, 10 meters high, *Killip & Smith 29929; 29868; Klug 1003; 1529; 3651; Ule 6258* (det. Ule). Amazonian Brazil.

Tapura capitulifera [Spruce] Baill. in Mart. Fl. Bras. 12, pt. 1: 376. 1886.

Much-branched climbing shrub, the older bark striate, the younger puberulent; petioles 4–8 mm. long; leaves elliptic-lanceolate, subequally narrowed to the acute base, shortly and subobtusely acuminate, to 8 cm. long, 2–4 cm. wide, subcoriaceous, glabrous and reticulate veiny above, paler and sparsely pubescent on the nerves beneath, very finely pellucid-puncticulate; flowers fragrant, to 3 mm. long, capitate-glomerulate at petiole tips; bracts and two obtuse bractlets as calyces densely whitish puberulent, the imbricate sepals very unequal; corolla slightly bilabiate, the two larger lobes bicucullate, two smaller entire; stamens unequal, the largest between the larger corolla lobes; ovary 3-celled, style slender.—F.M. Neg. 21497.

Peru (probably). Amazonian Brazil.

Tapura coriacea Macbr. Field Mus. Bot. 11: 68. 1931.

Glabrous tree 10–18 meters high, with grayish lightly angulate somewhat contorted branchlets; petioles 5–8 mm. long; leaves oblong-elliptic, cuneate-subrotund at acute base, subabruptly caudate-acuminate (acumen obtuse, to 1 cm. long), coriaceous, venation even beneath where dull inconspicuous, lustrous above, mostly 8–10 cm. long, 3.5–4 cm. wide; flowers about 10, inserted medially on the petiole, yellowish, 4–5 mm. long; pedicels 2 mm. long, gray puberulent as the 4 mm. long calyx, its obtuse sepals unequal; corolla lobes apparently only three, the two larger obovate, shortly bifid, strongly bicucullate, villous lanate within as the tube, the smaller subrotund; fertile stamens 3, equal.—The Williams' specimen from a tree with round trunk, the yellow or gray bark smooth or with few lenticels, the gray puberulent spheroid fruits 17 mm. long, 14 mm. thick. Perhaps nearest *T. guianensis* Aublet, 373, but the smaller flowers with equal stamens of which certainly only three are fertile, but otherwise the structure of the corolla and the foliage seems to resemble greatly, ex char., *T. capitulifera* Baillon, 376, with five fertile stamens.

San Martín: Tarapoto, *Williams 6554?* (fruit).—Loreto: Mishuyacu, near Iquitos, *Klug 602*, type; also *302; 586*.

Tapura guianensis Aublet, Pl. Guian. 1: 126. *pl. 48*. 1775. *T. latifolia* Benth. in Hook. Journ. Bot. Misc. 5: 291. 1853, fide Krause.

Tree, typically glabrous, with elliptic-lanceolate more or less acuminate leaves, obliquely acute at base, often 8–15 cm. long, 3–6 cm. wide, paler beneath, the slender veins reticulate arcuate at margin; petioles 5–10 mm. long; flowers glomerulate at or below the tip of the petioles; pedicels scarcely 1 mm. long; corolla lanate within, the clawed subequal lobes twice as long as the very unequal calyx segments; fertile stamens unequal; anther connective subglandular; staminodia two, entire or bifid; disk subentire or emarginate; ovary 3-celled, the three styles pilose; fruit subglobose or obliquely ovoid, lutescent ferrugineous, 1.5 cm. long, 1 cm. thick.—Bentham separated his species on the basis of outer broader lanceolate corolla lobes, the flowers in size and shape resembling those of *T. ciliata* Gardner, Hook. Icon. 5: *pl. 466* (*T. amazonica* var. *ciliata* [Gardner] Baill., 375), the younger, densely ciliate leaves with upper midnerve tomentose, and somewhat pubescent beneath. Apparently the Bentham plant was overlooked by Baillon in his account of the Brazilian species in Martius' Flora.

Ayacucho: Near Kimpitiriki, *Killip & Smith 22900* (det. Standley, *Stephanopodium peruvianum*); also *22857*.—Loreto: Iquitos, *Killip & Smith 27089* (det. Killip, *T. latifolia*). Florida, *Klug 1985?* (young). Soledad, *Killip & Smith 29722* (det. A. C. Smith, *Stephanopodium peruvianum*). San Antonio, *Killip & Smith 29447; 29512*. Amazonian Brazil.

Tapura Juliani Macbr., sp. nov.

Ramulis tortuosis glabris; petiolis 1.5–3 mm. longis, crassis, supra anguste marginatis; foliis membranaceis glabris vel subtus pallidioribus et junioribus sparsissime et obscure puberulentis, supra paullo nitidulis, oblongo-ellipticis, basi breviter acutis, apice acute vel subobtuse caudato-acuminatis, 9–12 cm. longis, 3–4 cm. latis; nervis praecipue subtus prominentibus, venis tenuiter reticulatis; cymis sessilibus 1–2 cm. remotis basin foliorum circa 7 mm. latis, minute cano-pulverulentis; pedicellis vix 0.5 mm. longis; sepalis obtusis 1 mm. longis; floribus vix 3 mm. longis, lobis majoribus ut videtur 2 ad apicem valde bicucullatis; antheris subsessilibus 3.—

Apparently a very distinct *Tapura*, the cream-colored flowers borne well above the base of the phylloidiform leaves; the type was a 2-meter tree.

In naming this for my well-known friend Julian Steyermark meritorious recognition is given of his generous co-operation in the preparation of this work, especially by his careful selection of herbarium materials for my study.

Loreto: Florida near Río Zubineta, *Klug 2010*, type. "Hibina."

Tapura leucantha K. Krause, Notizbl. Bot. Gart. Berlin 11: 136. 1931.

Glabrous except for the sparsely pilose branchlet tips, midnerve of the thin herbaceous leaves beneath and the densely tomentose sepals, these in life white or yellowish, unequal, oblong, obtuse, to 5 mm. long; petioles 3–5 mm. long; leaves narrowly oblong, subabruptly cuspidate, with acumen 1.5–2 cm. long, base a little oblique, 10–13 cm. long, 3–4.5 cm. wide, with 7–9 slender lateral nerves; flowers white, fragrant, few in axillary capitate cymes on the petioles, the two subconcave larger petals to 8 mm. long; fertile stamens two or three; style 1 cm. long, pilose to tip.—Like *T. peruviana* but smaller in all parts except the yellow calyx and snow-white flowers (Krause); and distinctions of doubtful value; the type from a 5-meter tree densely branched at 2 meters, the trunk 1 dm. in diameter. Flowers cream-colored, the fruit said to be yellow and edible (Mexia). F.M. Neg. 13145.

Loreto: Near mouth of the Santiago, *Tessmann 4545*, type. Above Pongo de Manseriche, *Mexia 6349* (det. Standley, *Stephanopodium peruvianum*).

Tapura peruviana K. Krause, Notizbl. Bot. Gart. Berlin 11: 135. 1931.

Branchlets as the 2–4 mm. long petioles sparsely pilose; leaves thin, glabrous except for a few trichomes beneath, nearly oblong or oblanceolate-oblong, longish cuspidate-acuminate, 10–13 cm. long, 3–4 cm. wide, the 5–6 lateral nerves little impressed above but prominent beneath; flowers in axillary petiolar cymes (on the blade above the petiole tip), yellow or orange in life; sepals ovate-oblong or oblong, obtuse, tomentose, to 5 mm. long; larger concave petals shortly bifid, 1.2 cm. long, smaller oblong; style glabrate above.—Type from a tree 10 meters high. The extraordinarily large flowers as well as the shape of the leaves make the species distinctive (Krause). F.M. Neg. 13146.

Loreto: Mouth of the Santiago, *Tessmann 4054*, type. Foothills, Sierra del Pongo, *Mexia 6188* (det. Standley, *Stephanopodium peruvianum*).

4. GONYPETALUM Ule

Characters of the family in general. Flowers irregular, including the basally united sepals, the two larger long-clawed petals attached at base with fertile stamens, then twice geniculate and terminating in a bilobed tip, the three smaller completely free, unparted but also geniculate. Filaments of the three fertile stamens pubescent at base; anthers cordate. Disk with two glands at base of sterile filaments. Style filiform, shortly 3-parted.

Leaves minutely and sparsely pubescent beneath; flower clusters sessile.

Leaves acutely acuminate, mostly about 8 cm. long, membranous. *G. acreanum.*

Leaves obtuse or very shortly and obtusely acuminate, mostly about 5 cm. long, coriaceous.....*G. Tessmannii.*

Leaves deciduously but densely pubescent beneath; flower clusters somewhat peduncled.....*G. juruanum.*

Gonypetalum acreanum Ule, Notizbl. Bot. Gart. Berlin 6: 312. 1915.

Branches slender, terete; petioles 6–12 mm. long; leaves obovate-oblong, slenderly long-acuminate, 7–10 cm. long, 2.5–3.5 cm. wide, membranous, revolute-margined, glabrous above, sparsely pubescent beneath, mostly on the slender nerves; flowers 20–30, subsessile in crowded cymes, densely lanuginose; petals ochroleucous (or white), the two larger nearly 5 mm. long, biparted into two obovate concave lobes, the three smaller entire; stamens 5.5 mm. long, the three fertile high connate with the larger petals, the two sterile little adnate with the small petals; filaments as style and bases of petals very arachnoid-lanate; disk lobes two, fleshy.—Author found variation in nature of flowers suggesting *Tapura*. Type from trees 15–30 meters high in terra firma. *G. juruanum* Ule is similar, but the larger (14–16 cm.) leaves tapering more gradually to tip and densely pubescent beneath. *G. lanceolatum* Ducke, Archiv. Jard. Bot. Rio Jan. 6: 43. 1933, of the lower Amazon, is marked by glabrous lanceolate leaves 5–9 cm. long, 2–3.5 cm. wide, stamens subequal, the long filaments strongly white arachnoid. F.M. Neg. 45852.

Loreto: Río Mazán, *José Schunke 142* (det. Standley, *G. Tessmannii* Killip, *Tapura guianensis*).—Río Acre: Seringal San Francisco, *Ule 9524*, type.

Gonypetalum juruanum Ule, Verh. Bot. Ver. Brandenb. 48: 174. 1907.

Younger parts including petioles and calyces thickly covered with a yellowish tomentose puberulence; petioles 4–6 mm. long; leaves oblong, attenuate at base, caudate acuminate, 14–16 cm. long, 3.5–4.5 cm. wide, membranous, glabrous above, densely pubescent beneath; inflorescences at tip of petioles; peduncles to 3 mm. long; larger petals 6, smaller 5 mm. long; three fertile stamens 5 mm. long, the filaments lanuginose.—Type a 10-meter tree from inundated woods at Juruá, Brazil. F.M. Neg. 45851.

Río Acre: Mouth of the Río Macauhán, *Krukoff 5381* (det. A. C. Smith, *Tapura capitulifera*). Brazil.

Gonypetalum Tessmannii K. Krause, Notizbl. Bot. Gart. Berlin 11: 137. 1931.

Stout branchlets tomentulose; petioles 6–9 mm. long; leaves oblong or obovate-oblong, 5–6.5 cm. long, 22–26 mm. wide, rather broadly and obtusely acuminate, rigid-coriaceous, glabrous and lustrous above, appressed pilose on midnerve beneath, otherwise glabrous; lateral nerves 7–9, impressed above, prominent beneath; flowers in capitate axillary cymes at tip of petiole; sepals unequal, ovate-oblong, 2.5 mm. long, puberulent-tomentulose as the shorter pedicels; petals yellow, unequal, larger 2.4–5 mm. long, long-clawed, twice geniculate, biparted, the three smaller undivided; fertile stamens three, 6 mm. long, anthers lanuginose; ovary tomentose.—Differs from both described species by the broadened leaf-tip (Krause), but is doubtfully more than a variant of *G. acreanum*. The type from a 25-meter tree with trunk diameter of 1.3 meters, densely branching at 15 meters. F.M. Neg. 13152.

Loreto: Near mouth of Río Pastazza at San Isidro in flood-free woods, *Tessmann 4987*, type.

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